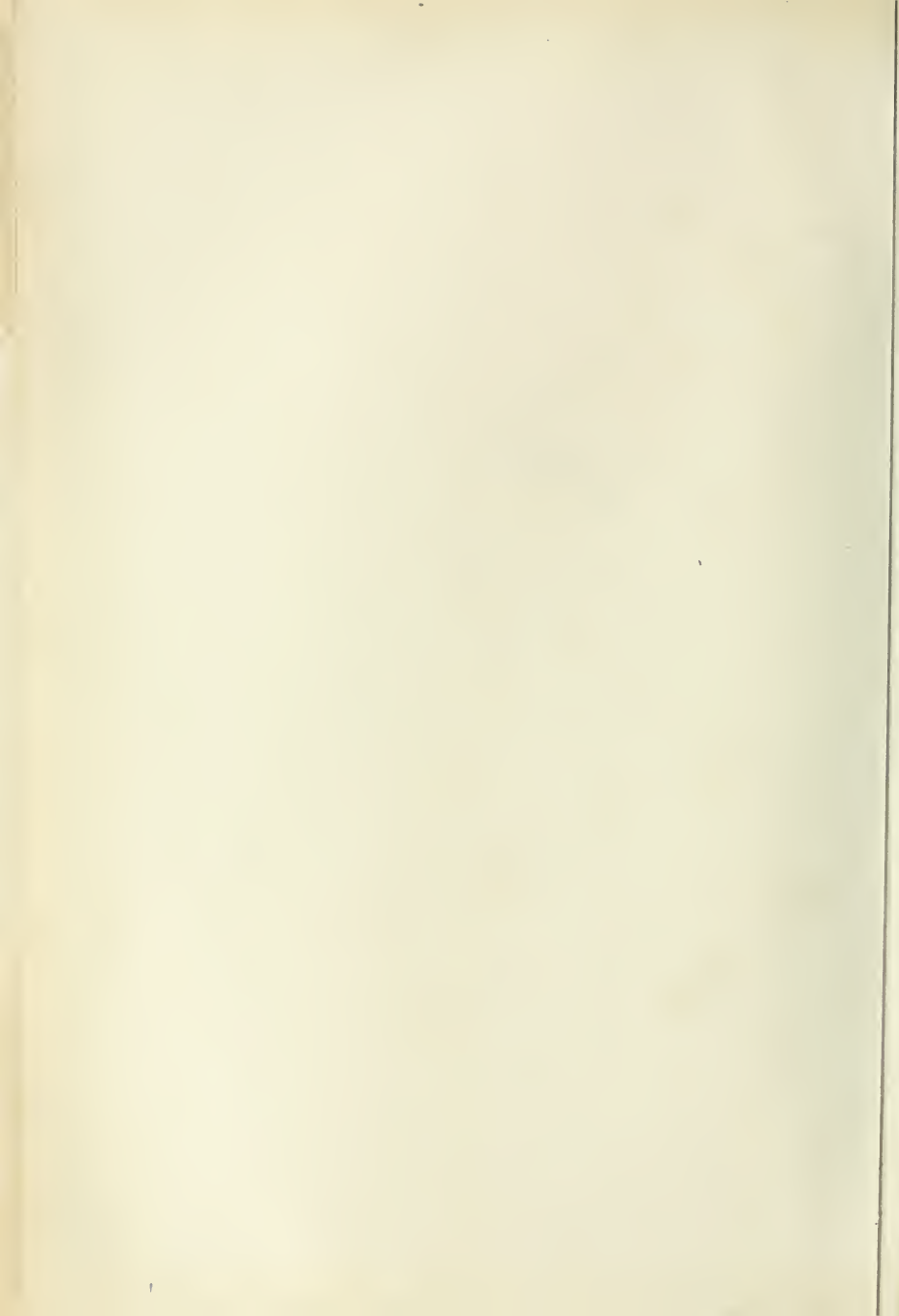
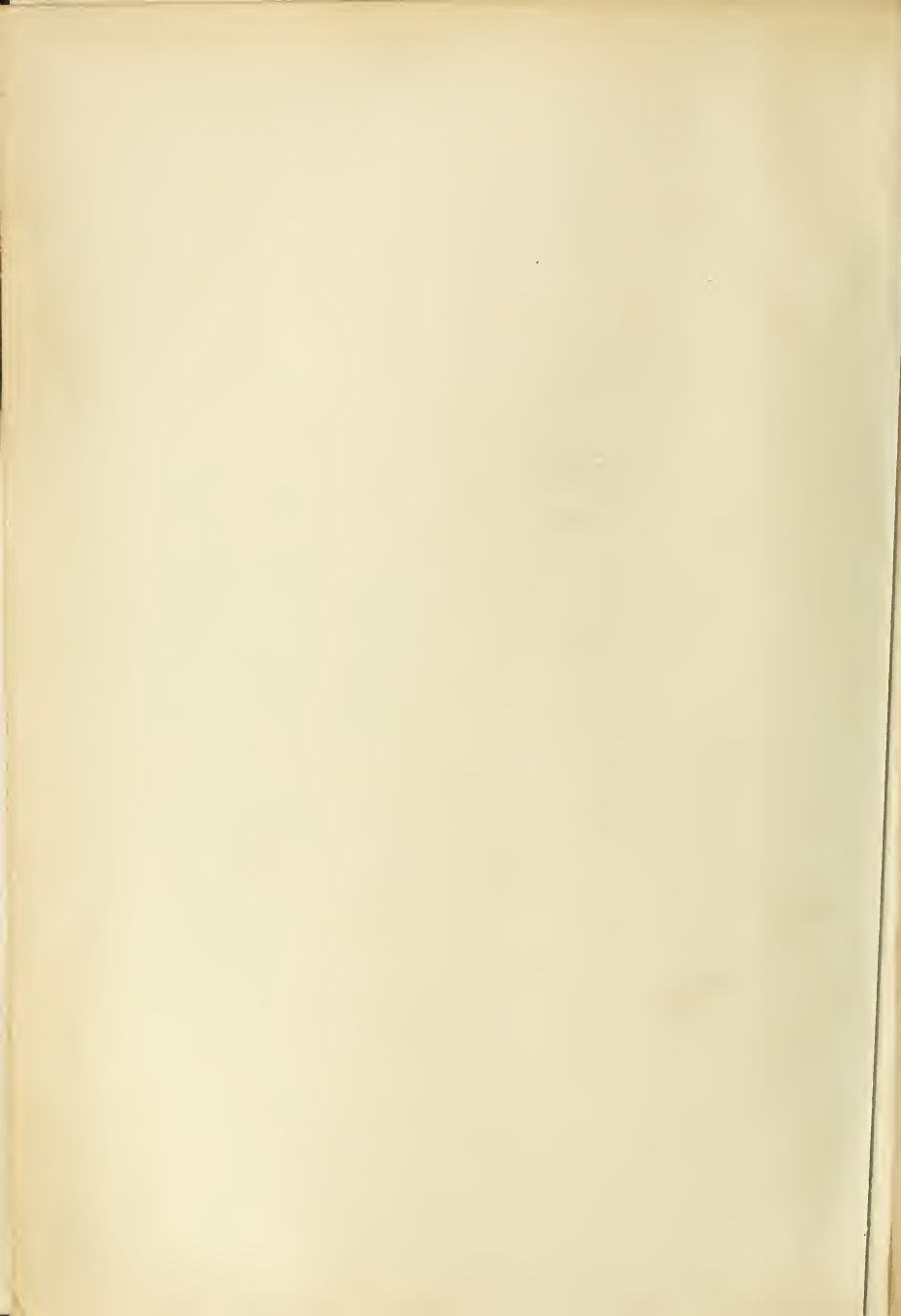




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THE BUILDING NEWS

AND

ENGINEERING JOURNAL.

VOLUME THE EIGHTY-FIRST.

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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

SUBSIDIARY PROFESSIONAL DUTIES.

THE professional man of to-day is no longer able to devote himself exclusively to the art and craft of his vocation, or to a *dilettante* study of artistic literature, as his ancestors did of the Middle Ages and Renaissance period. Such a devotion to art is one possible with a few individuals favourably placed, who are not compelled to gain their livelihood by the practice of their profession. Not many among the leading men in the profession have the time and opportunity to devote themselves exclusively to architecture or to art, either practically or in a literary sense, and, no doubt, this is one reason why architecture as a profession is so disappointing to some minds. The natural-born artist, with the instincts of his craft, is shocked to find the opening for him very small; that all the best work is in the hands of large commercial firms and contractors. The man with literary tastes or skilled in delineating architectural subjects, and of following the genial occupation of the *dilettante* finds that it is unremunerative. On the other hand, the most successful practitioners are those who have mastered the subsidiary duties of their profession, and have made surveying and valuation important branches of their business. The "all-round" practitioner equipped in the miscellaneous knowledge of the business man, the company promoter, the counting-house, and of technical points of law, who can make himself useful in the promotion of a company in finding capital, prepare valuations for mortgages, value a farm or brewery, in addition to his other professional duties as architect, has the undoubted prospect of obtaining commissions for the most important municipal or commercial buildings, while a man of greater skill as an architect may wait for years before he gets a chance. Such is the irony of fate. It is useless to lament, or to try and prevent this misappropriation of favours: the business and official mind knows and cares little about art; but it at once appreciates and favours the possessor of practical talents. And what an ever-extending sphere of duties is that now assigned to the architect! His profession may be said to touch in various points other professions, such as those of the surveyor, the valuer, the estate agent, the lawyer, the medical practitioner; various sciences, trades, and industries allied to building. The contact with the first-named professions—those relating to land and the surveyor's interests—has made it necessary that the architect should know something of them. The connection of land with buildings is so intimate in many ways that it is not surprising that the duties of the surveyor and valuer have a direct bearing on those of the architect. No doubt the formative arts associated with land have the closer connection—such, for instance, the duties of

draining, laying out, landscape gardening, and planting—duties which come rather within the provinces of the land surveyor and landscape gardener. But our purpose is to show that the professional architect must have a general knowledge of duties that lie rather outside his immediate vocation. For example, one of the duties he is expected to fulfil in country districts is the valuation of landed estates, in which presumably there are buildings erected of various kinds. The average town architect knows little about landed estates, though in the discharge of his duties as an architect he may be called upon to give some idea of the value of land for sale.

The client may wish to secure a good investment for capital, for which purpose it is necessary to ascertain particulars of the estate, the rental value of each field, its cultivation, the kind of farm and its conditions, the homestead accommodation, the condition of the buildings, water supply, timber, and the general eligibility of the estate, its proximity to railways, &c. For a large landed estate of course the client would be advised to obtain the services of an experienced land valuer; but the provincial practitioner is expected to know something of the value of estates, and for this a special knowledge is necessary. Nor must it be forgotten that buying and selling are two different things. The valuation may be for a vendor who wishes to sell, or for an adjoining owner who wishes to buy; each case has to be dealt with differently. The information supplied by the vendor may be biased; but in the latter case the transaction may be more difficult. Sometimes the architect is asked to give a rough valuation of an estate for an owner adjacent to a property put up to auction, said owner being willing to buy. In such a case some tact must be displayed and a knowledge of the property to be sold. The land and the buildings on it must be examined, their suitability, state of repair; also the condition and repair of fences and gates; whether the fields require to be drained, and if so how deep they have to be laid. These are points within the sphere of the architect's duties. The design and construction of the farm buildings and house are important matters, and for this purpose the architect ought to possess a rough-and-ready means of estimating any necessary repairs, and the annual cost of maintaining them. For this purpose schedules of prices based on local conditions of material and labour are required. Such a schedule should be prepared in lump form, such as stone and brick walls including footings, arches, &c., per perch or yard, raking out and repointing walls, cement stucco per yard, roofs per square of slate or tile, cost of retilling or relaying, floors per square, taking up flooring boards and relaying per square. It is not difficult to obtain prices for such items in country districts upon which the architect

can rely. In this part of the valuation his special knowledge of buildings, the condition of the walls, floors, and roofs, the kind of materials used in them, will enable him to make a close approximation to the cost of repair, which the mere valuer could not. The professional adviser is also frequently called upon to determine the question of competition between purchasers: the competitive element comes into the calculation. The number of years' purchase land or estates will be worth depends on such considerations.

How to make the estate attractive, or any property naturally so by being near a railway station or town, or that commands extensive and pleasant views, are points that the architect is expected to make the most of. If it is eligible for residences he ought to be able to show how it can be made so, so as to attract purchasers. These are questions that call for some knowledge, tact, and discrimination, so that the surveyor may adopt a number of years' purchase that will give a proper rate of interest or that will satisfy the would-be investor. Thus, for property of a residential kind, he must determine the number of years' purchase it is worth—and this can only be done by considering the characteristics we have mentioned, the state of repair of all buildings, and the prospective value. The capitalisation may vary from 25 to 33 years' purchase: for villas and re-idences it may range from 16½ to 22 years. For speculative purposes a lower rate ought to suffice, bearing in mind increasing value in the future. Where the architect often falls in matters of valuation is in want of tact in *vis-à-vis* negotiations; he may be skilful in plan and design of buildings, and in making valuations, yet be quite unable to conduct a negotiation between vendor and purchaser. For a valuer it is necessary to be able to read the mind of each, as it were; to understand what the vendor wants to sell for, and the reason that mainly influences the mind of the purchaser. If the object of the purchase is to obtain some advantage, it may be worth the latter to accept a smaller interest. More frequently the architect is called upon to value town properties. Here he has to exercise his skill and discrimination in valuing premises in different streets, their position for business or trade, their adequacy of accommodation, and if suited for an improving business. Valuations of this kind depend upon an improved rent as a basis, deducting any capital to be expended in improvements or rebuilding. In many London streets rebuilding on an improved scale may double the value of the premises; corner shops are more lucrative than those with only one front. Light and air, space for extension in back or front, rights of light, access in rear, and plan of premises are all to be considered. In this kind of business the average cost per cubic foot is important, or the architect may make a fair allowance

per cent. of an accumulation, as in the case of churches and schools, which may vary from 27 10s. to £12 per cent. for the first year from 27 to £10 per pupil. Having determined the rental value of the premises, the deductions for repairs, insurance, collection of rent &c., have to be considered. Certain percentages are allowed for these: For repairs they will vary for different kinds of premises, those not substantial or out of repair the percentage may be as much as 12 to 15 per cent. on rental. The capital value has then to be found by selecting the number of years purchase that will be required, and in this determination the architect has to use some discretion, as, for instance, for shops and business premises it may vary from 13-35 to 16-667 years, producing from 2 to 6 per cent. A very frequent duty the provincial architect is called upon to perform is to make valuations for mortgage, a work which may be done with responsibility as when the valuation is made for trustees. Valuation for mortgage is not like that for purchase, although the same calculations are made. It should be borne in mind that the value being for loan, all exaggerations and attractions are to be avoided, and a larger multiplier is generally adopted.

The development of building estates is another matter which is often referred to the architect. He is perhaps asked to make a plan and to give an estimate for laying out roads and draining the land—of a site that is considered eligible for building purposes. Many considerations are necessary. Is there a necessity for houses?—such as the necessity created by a manufactory, &c., a demand for houses is the chief of these, whether for a good class of resident or for *ouvriers* of labour, with convenient access by road or rail; nearness to a railway station, salubrity of site, good soil and water supply, and gas and other particular attractions have to be considered. The valuation of the estate as building land is one of the first steps. The cost of roads and sewers has to be found, and on the other side the value to be derived from the plots. Very often the procedure is reversed. Instead of finding out the cost of drainage and road making, the income to be derived from the fully-let plots as ground-rent is made an inducement for putting into the market a larger area of land than there is any demand for. Then comes a slump in the market, the land is not sold, and the "jerry" builder at last comes to the rescue, and the whole is covered in a few years with jerry-built houses of the worst kind. The architect, alive, should be to only open up a small area of the estate at first, and to let the practical builders of a good class of houses, which at once gives a proper base and character to the estate. To ascertain the expenditure is the first step. The cost of erection of suitable houses and the ground-rent are matters that are within the architect's province. Having found the total family ground-rent from so many houses, he next attempts it to find the fair value, but from this sum must be deducted the cost of forming roads and sewers, legal and surveyor's expenses. A pretty accurate knowledge of the Valuation Tables of houses, and the modes of valuing houses and annuities, &c., in addition to his representation of the cost of making roads and sewers, paving, and lighting, is necessary in preparing plans and reports, and estimates of the kind.

A lucrative branch of professional business is that of assessing dilapidations; yet, from the questions one occasionally receives, it is clear that the subject is not understood as it should be. The subject is one requiring an elementary knowledge of the law of landlord and tenant, and of the rights of the tenant. What does a dilapidation mean? What is

"waste"? What is implied by "voluntary" and "permissive" waste? What are the liabilities of different kinds of owner, or those expressed or implied between landlord and tenant? have to be mastered. The nature of the tenure is important; thus the owner in fee simple is not liable for waste unless he allows his house to become a nuisance, but a tenant for years is liable for waste, especially a voluntary waste; a tenant from year to year is liable for all acts of voluntary waste, but not for permissive waste, so a tenant for life is liable for voluntary waste. Many manuals on the subject of dilapidations provide the professional man with the requisite information, and with regard to ecclesiastical dilapidations, as between outgoing and incoming incumbents; the practitioner is expected to bring to the duty a general knowledge of the law, and of the principles of valuation, and of the Act controlling the same. But for dilapidations of this kind the Act provides for the appointment of a surveyor for each diocese, approved by the bishop. Various other subjects of a collateral kind come before the professional man. Compensation is a frequent and very necessary function, and for a knowledge of the questions involved we must refer the reader to special works, such as "The Law and Practice of Compensation," by Mr. Freeman, and "Hints to Young Valuers." Often properties are compulsorily taken for some public purpose, and the architect's opinion is asked as to assess the amount of damage caused by a railway crossing a building estate, or the making of a new roadway through old premises; for disturbance caused by removing fixtures and cost of removal. These are questions that can only be solved by the application of the principles of valuation to the various interests concerned. If we suppose some town property to be taken compulsorily, the rental of which is through circumstances improving, and it is worth more, perhaps again, as a building estate, the question of the value of the lease, it becomes important to consider how many years' purchase of the improved rent must be taken for the unexpected term from which the capitalised value is to be obtained, in addition to the 10 per cent. for compulsory sale. Every case of compensation must be taken on its own merits, and no hard and fast rule can be adopted. Sometimes lands or premises are injuriously affected, and compensation is demanded. These generally refer to rights of light or air, right of way, &c.; and all these must be separately assessed. For the above branches of practice we refer the student to such a book as that of "Hints to Young Valuers," we noticed lately.

In short, the elements of measurement and valuation enter very intimately into and concern the architect's functions. The taking-out of the quantities of buildings is one of the most direct and practical examples. He must be familiar with the method of putting up each artificer's work, and also of putting a fair value on it, for which purpose he must be able to take to pieces various kinds of work, so as to be able to put a fair price upon the quantity per foot cube, per square, or lineal foot, or yard. For this special class of practice an expert knowledge is demanded. The architect is placed in a very disadvantageous position if he cannot, when called upon, be able to examine the correctness of quantities prepared from his own drawings, and even if need be, to find the quantities out for himself, for which purpose he must be able to make general estimates. If he is obliged to hand over this class of practice to special surveyors, by reason of the largeness of his practice, no one can blame him; indeed, it is much better that the architect in a good special practice of his own should relegate all such work to a quantity surveyor; but it is quite another matter if this relegation of work is owing to his ignorance of quantities and the valuation of materials or the methods used. The

architect at least should be acquainted with certain fixed rates or values, and the amount of labour expended on materials. For this purpose the use of tables of "constants" will be of service. Certain methods of valuing work, such as cubing, estimating by the foot or yard superficial, or by the square, a knowledge of the proportional value of materials and labour in certain trades, and a set of tables prepared giving the average ratio of each trade in certain classes of structures, are useful aids for approximate calculations. We are not pretending that these miscellaneous duties are absolutely necessary, or should encroach on the architect's more special studies; but they often enable the general practitioner to extend his practice, which without their aid he is not in a position to do.

OBSTRUCTIVE AND OVERCROWDED DWELLINGS.

"BACK LANDS" is the name appropriately given by the late Dr. J. B. Russell, the Medical Officer of Health for Glasgow, to describe the narrow, dark, and dismal habitations behind other buildings to be seen in Glasgow, and not so long ago in other great cities; and in a recent paper delivered by Mr. Peter Pyfe, the chief sanitary inspector of Glasgow, we are brought face to face with many sordid features of town life. These are, he says, the "past private greed and public neglect." These "back lands," or tenements situated behind premises that face the street, are practically "obstructive buildings," so called in the Housing of the Working Classes Act, 1890, as in many cases "they stop ventilation, or conduce to make such other buildings to be in a condition unfit for human habitation, or dangerous or injurious to health." Yet they remain to darken and pollute the street, and the many of our evils. Mr. Pyfe says that the Glasgow back dwellings; but what he says applies to all buildings or "back lands." It is true that some of these buildings are not obstructive: they have ample air-space for ventilation and access of light, area for ashpits, and other conveniences; but they often prevent proper measures being carried out for remedying any nuisance injurious to health in respect of other buildings. Both these conditions are a peril; but the owner can say they have been permitted by former authorities, and that he has invested money in them, and resents any interference to suit modern requirements of the law. He can appeal to the Supreme Court or Court of Sessions in Scotland; if he fail to establish his claim, the property may be demolished. But the owner can now claim compensation for the site, and for building, based on its fair market value. As Mr. Pyfe points out, these proceedings may be protracted before an arbitrator appointed by the Local Government Board. In this arbitration there are three forms of debate first, whether the rents have been enhanced by overcrowding or other illegal use of the dwellings; second, whether the dwellings are insanitary in themselves or not in reasonable repair; and third, whether the building or any part of it is unfit for human habitation. If all these things cannot be proved, then full compensation on rental must be paid, no allowance being made for compulsory purchase; but if the first can be proved, the third may reduce the rentals as a basis for compensation; if the second, he can deduct the estimated value of putting the premises into "reasonably good repair"; if the third is proved, then only the site and value of materials can be claimed by the owner.

These provisions, it will be seen, make it very difficult for any local authority to take advantage of the owner. As the author of

the paper observes: "the law hedges the owner round with penal weapons of defence," provided he can afford to pay for them. It at least enables him to petition the Local Government Board within two months after the order for demolition, and delay its operation. The local authority has to "prove its case against an obstructive building up to the very hilt." We have on a former occasion explained the action of the 38th section of the Housing of the Working Classes Act—how the law can be set in motion by the medical officer of health, or by any four or more householders in the district; but the provisions of the Act itself are open to objection. For instance, if the obstructive building "stops ventilation" it is liable. But what is meant by this term ventilation? We believe the real meaning of the framers was anything that will check a "free circulation of air," but as the word ventilation is used, the meaning is open to many quibbles. Stopping ventilation cannot properly be applied to any back building if it has windows and fireplaces, even supposing it is very closely hemmed in by other buildings. But the other part of the clause, that "otherwise makes, or conduces to make, some other building unfit for human habitation" may more aptly describe a dwelling deprived of a free circulation of air. As it stands, however, we are quite of the opinion that the words used in the Act would admit of evasion, for not plainly saying what is really intended. Instead of employing a term that implies quite another condition, and which many of these objectionable and hemmed-round dwellings really possess to a degree that would technically save them. Daylight as a health-giving agent, is singularly enough, not named in the Act, and therefore we have this anomaly—a hemmed-in building deprived of sufficient daylight to be healthful, if it does not "stop ventilation," will be exempted. This omission is a serious one, for a reasonable amount of daylight is necessary to make a building habitable; but under the Act, the want of sufficient light alone would not be considered sufficient to condemn a dwelling.

In these "back lands" the occupants have to endure this want of daylight for many months in the year. Legislation has of late years begun to mitigate the grievance by providing a certain width of street. In London the provisions for space at rear of domestic buildings as given in section 41, sub-section iii., enable a certain amount of daylight to be secured by the method described in the latter sub-section—namely, that an angle of 63° be allowed above the horizontal line; no part of the buildings in the rear extending above the diagonal line except chimneys, dormers, gables, turrets, and other architectural ornaments. Then, in the next section, open space is to be provided about certain dwelling-houses inhabited by the working classes. The Council are empowered to refuse to sanction any plans that do not provide what they consider a "sufficient open space (or spaces) for the admission of light and air thereto." In Glasgow, the Police Act (1896) requires that there shall be a free space of not less than three-fourths of the height of the wall of the building in which the window is situated. In other words, a building, say four flats high, 40ft. in height, is to have a free space in front of it of 30ft. If we draw a diagonal line from the top of building opposite, through the window of lower flat, touching the window head, it will touch the floor 6ft. 4in. from the window, and from which it will be seen that the light of the sky will only be visible at this distance from the window, and therefore the rest of the room will be in comparative shade. A building 40ft. high to receive the light, the whole depth of the room should be at least 60ft. from the opposite side of street, as shown by Mr. Fyfe. Buildings

that do not conform to this rule or width of street are, according to the Act of 1900, not adequately lighted, and are practically in the position of obstructed buildings by the Glasgow Buildings Regulation Act, and are destined to be closed. From a practical point of view it may be assumed that a building is scarcely fit for human habitation when it is not sufficiently lighted to enable any inmate to read or sew during winter, and the authorities of our crowded cities will have to determine a standard of lighting below which such dwellings should be closed. Any rigid rule as to lighting would exclude a large proportion of the back premises not only of Glasgow but of London. The ranges of dwellings, or "back lands," illustrated by Mr. Fyfe in his brochure taken from photographs, are instructive examples of this kind of overcrowding. One shows a range of two-story dwellings behind four-story properties facing a main street in Glasgow; the distance between the two ranges is 21ft. The ground-floor windows of very dark, and the ashpits are placed close to the dwellings; but we think we can show parallel instances in many parts of London. Other illustrations show how these back dwellings have been built upon the area which should have been given as back courts of the front houses; or how courts have been built upon as to make a second "back land." In many of these, as in the Cowcaddens district, the crowding is very great, and in some cases the ground-floor windows are so close together that it is not possible to read a newspaper in broad day near the window, and everything has to be done by the aid of lamplight in these dingy, airless dwellings. The author refers to many points in the problem which affect all great cities. He refers to the closeness of ashpits, which, according to the Glasgow Building Regulations, are not to be less than 12ft. from the wall of any dwelling-house, which assumes that no court between buildings is to be permitted of less width than 30ft., and recommends the "sweeping away of all back lands in the city which, being behind a building of more than two stories in height, are not further removed therefrom than 20ft., vested rights notwithstanding." The importance of impervious surfaces, such as asphalt, in these back lands or areas is evident, so as to prevent the accumulation of disease germs. No fewer than 2,000 one- and two-apartment houses require, according to the author of the pamphlet, to be built at once, convenient to the city, and it is suggested these should be erected in blocks on lines similar to those erected on Haghill, where £14,425 was spent in providing 153 labourers' dwellings, which would involve a cost of £180,000, and accommodate, at the standard of occupancy of 400-ft. per adult, 12,974 persons. The author hopes Glasgow will not fall into the mistake of London particularly in her Boundary-street area scheme, whereby 5,719 persons were displaced, and 4,000 immediately before the dwellings were ready for them. It is needless to say that the rooms provided in the Metropolitan are smaller than those in Glasgow. A kitchen 13ft. by 11ft. by 8ft. 6in., and a bedroom 8ft. by 8ft. 6in., or a total of 2,099-ft. in two apartments, are let by the County Council for 5s. per week; but in Glasgow the corporation let a two-apartment house of 3,500-ft. for 3s. 10d. per week. A one-apartment house is a necessity; but the available area of these rooms is not less than 1,600-sq. ft. of free air-space. Of course, such an allowance would be practically impossible in London for the rent named. We have a strong conviction that a large percentage of town workers would prefer accommodation near their work in towns, and this view is supported by the opinion of Mr. Fyfe in his paper, to which we draw the attention of all readers interested in the housing problem. In London, the building over of back areas is a process that has been going on for many

years—a proof, indeed, of municipal neglect and private greed. This overcrowding has borne its fruit of disease and increasing mortality, and the authorities in all our great cities have awakened to the danger, and are trying to avert the mischief by stringent legislation. No one can say, however, that the private owner has suffered, or that his vested rights are being interfered with. He has ample opportunity given him of rectifying palpable abuses of overcrowding, of improving the sanitary condition of his premises. But the great aim of present-day legislation is prevention—of enforcing a sufficient area for light and air in the erection of new dwelling-houses, and in removing all obstructive buildings in the future. There are many persons who are still ready to defend "back land properties," and maintain that they are proper dwelling, for town workers; but their arguments are unfortunately based on personal interest.

"BUILDING NEWS" DESIGNING CLUB

A SUBURBAN VILLA.

THE three designs among the leading positions come in the following order:—1, "Dan"; 2, "Pencil Point"; 3, and "Quercus". We illustrate them all, so that their merits and faults can be seen at a glance. Generally speaking, the competitors failed because they omitted to observe the conditions of the site, or they set out their building without considering how to make the most of the available plot. It seems strange that a competitor should go to the trouble and labour of working out a scheme, elaborating it cleverly, no doubt—at any rate, in parts—and yet ignore so elementary a limitation as the restrictions of the site on which he intends to erect his design. A client would not have left him but to reject such ill-considered plans as unsuitable, and that is just what we have been compelled to do. "Dan" is on the whole the most successful, though "Pencil Point" economises his ground better, and shows how he would use the yard, which in "Dan" is left wide, with a garden on the west side towards the return road. In this last particular, he is more like the third man, "Quercus," who insures a way round the house on the north—a gain impossible in "Pencil Point's" arrangement, to which no cubic calculations are added—an oversight on the part of the author.

We will now endeavour to point out some of the reasons which induced the choice we have made, as already stated, and also our criticisms on the plans. The w.c. and lavatory next the entrance porch is not a good arrangement. The master of the house might be there when someone called; the servant, not knowing his whereabouts, would possibly leave the caller waiting in the hall. Either the master must wait till the coast is clear or make it needlessly evident where he has been, and so that could be prevented. The house has not already been advertised the fact. The hall is roomy; but when the total space devoted to vestibule, cupboard, w.c., hall, and stairs is considered, the arrangement is not an economical one for so small a house. The back stairs isolates the kitchen and the service lobby, but the two parlour doors close up on either side of the service lobby do not appear to be ideal in their arrangement, which should aim at keeping the kitchen and office as much out of sight as possible, and also to keep back the smell of cooking in the house so that can be managed. The juxtaposition of the sitting-room doors with the culinary department is not the best way to obviate this difficulty, for in a small house it is a difficulty no doubt. The two reception-rooms are fairly good, with the fireplaces well away from the doors, and, being recessed, the full of the chimney breasts, though the fenders would project into the rooms. The absence of a good pantry is a fault, for the space under the servants' stairs is not equal to the occasion. Otherwise the domestic offices are fairly correct, though the servants' w.c. close to the tradesmen's door, cannot be considered a desirable arrangement. The coal-place and cycle-shed are figured to be at back of yard, but do not appear in the drawing. The bedrooms are nice enough, though the passage leading to w.c. is not economical for a house where every inch is of consequence. The landing

Two suggestions from Westminster proposed by Sir J. Wolfe Barry, and seconded by Mr. Henry Tazer, were agreed to. They were:—
 "That in order to ascertain the immediate responsibility of each borough council, a simultaneous special inquiry be made by each council as to the number of the working class that it may be necessary, by the conditions and circumstances of their employment, to house within the area."

ANALYSIS OF THE PRICES OF STONES DELIVERED IN LONDON.

Name of Stone.	State sent.	Net price at Quarry per F.C.	Number of F.C. per ton.	Cost of Carriage per ton to London.	Cost of Carriage per F.C. to London.	F.C. per C. delivered at London Terminus.
		s. d.		s. d.	s. d.	s. d.
Abercree, Monmouthshire . . .	Random blocks.	0 4 133	133	14 6	1 0 7	1 5 1
Ancaster, Yorkshire	" "	1 2 16	16	9 4	0 7 1	1 9
Anston, Lincolnshire	" "	1 3 19	19	10 0	0 7 1	1 10 1
Bath, Somersetshire	" "	1 10 16	16	10 4	0 7 1	1 10 1
Bolsover, Nottinghamshire . . .	" "	2 0 15	15	8 9	0 7 1	2 7
Bransley Fall, Yorkshire	" "	0 10 16	16	10 0	0 7 1	1 10 1
Chalmers, or Wadlow, Walsbire .	" "	1 5 14	14	15 4	1 8 1	2 13 1
Corsbush, Dumfriesshire	" "	1 3 14	14	15 6	1 1 7	2 5
Doubling, Somersetshire	" "	1 0 16	16	10 0	0 7 1	1 7 1
Granite, Aberdeen	Scabbled to size.	—	133*	—	—	3 0
Granite, Devonshire	" "	—	133	—	—	3 0
Hopton Wood, Derbyshire	Random blocks.	3 0 14	14	8 4	0 7 3	3 7
Minsell, Nottinghamshire	" "	1 5 13	13	8 4	0 6 2	2 0
Punswick, Gloucestershire . . .	" "	1 0 16	16	10 0	0 7 1	1 10 1
Parkeston, Yorkshire	" "	1 8 15	15	13 0	1 0	2 8
Portland, Dorsetshire	" "	1 4 15	15	8 0	0 6	1 10
Parkeston, Yorkshire	" "	1 6 14	14	14 6	2 0 6	3 10
Roche Abbey, Yorkshire	" "	0 10 16	16	10 6	0 8 1	1 6

Selected blocks 10d. per foot cube extra.

* Carried by rail as 16 F.C.

each borough"; and "that reasonable modifications of the existing building laws and regulations are necessary in order to facilitate the further erection of industrial dwellings."

The conference was adjourned till a date not yet fixed.

HOW TO ESTIMATE; OR, THE ANALYSIS OF BUILDERS' PRICES.—XIII.

By JOHN T. REA, F.S.I., Surveyor, War Dept.

MASON.

IN the valuation of stonework the points for consideration are the price at quarry and the state in which it is sent from there, the cost of carriage, the final cost when delivered, and then the valuation of the different labours according to the finish required, the setting, and the profit on the whole. If the stone is worked at the quarry, there is a saving in the weight for railway carriage; but then the cost of that is nearly 40 per cent. more than for rough stone. Freshly-quarried stone is more easily worked than when seasoned. Granite is usually quarry-worked.

A large proportion of the stone trade is done through merchants, and several large quarry-owners look to them only for their business. The ordinary building contractor is not always competent to undertake the stonework, and it is better for him to let the work to a firm of stone merchants.

The above table shows how the prices are arrived at for stone delivered in London, and from this and the relative value of labour the cost of items in other kinds of stone may be readily ascertained by comparison with Portland. The railway rate refers to full truck-loads of about four tons and upwards.

Measurement of Stonework.—The London practice is to measure the stone per foot cube in rough blocks, and then measure the labour to each face separately in detail at per foot super. There is an exception in the case of ashlar work, which is usually described at per foot super, including beds and joints, and stating average thickness.

Another method is to include all labour with the cubic contents, giving full descriptions and sketches. The former is the more exact, but the latter is frequently adopted to save trouble.

As already stated, the full dimensions of the block-stone which will contain the proposed finished stone must be taken. If an experienced mason can saw or cut two or more pieces out of a block which is only supposed to be sufficient for one, then that would go to his credit, and no deduction would be made.

LABOUR.

There is considerable difference of opinion as to the descriptions of the various labours executed on stonework, but the list below is generally accepted. As the cut of a saw will divide a stone into two pieces, the labour of the surface so cut is described as "half"-sawing. When other labours are stated they include this item, which is only taken to a surface when no other labour is intended. Half-sawing is more frequently called half-bed or half-joint, but the old description is more precise. Plain work is the surface so produced after all inequalities have been dressed down, so as to yield a plain face or even surface, which may be tooled stroke for hard stones, such as Portland or York, or a combed or dragged face for soft stones like Bath or Doulton.

The time constants per foot super, and cost are those applicable to Portland stone, which is the best known in the kingdom.

	Constant.	Per ft. super.
Roughly dressing sides of blocks	12 at 10d. = 0 11	
Half-sawing	33 " = 0 3	
Half-plain or sawn work, straight, as in beds or joints	36 " = 0 3	
Ditto ditto ditto ditto	39 " = 0 3	
Plain work, straight, as in faces, &c.	100 " = 0 10	
Ditto circular ditto ditto	160 " = 1 4	
Sunk work, straight, as in slabs or battens	180 " = 1 2	
Ditto circular ditto ditto	140 " = 1 0	
Ditto straight, as in beds	170 " = 1 1	
Ditto circular ditto ditto	240 " = 2 0	
Moulded work, plain, straight, as in cornices	240 " = 2 0	
Ditto circular ditto ditto	300 " = 2 6	
Regular work to shafts of columns	300 " = 2 6	
Circular circular work, as in spheres and balls	450 " = 3 9	
Rubbed work, straight, as in fore-frames	15 " = 0 1	
Ditto ditto circular	20 " = 0 2	
Ditto ditto straight	25 " = 0 2	
Ditto ditto sunk circular	25 " = 0 2	
Ditto ditto moulded, straight	25 " = 0 2	
Ditto ditto circular	30 " = 0 3	

Work done in position is worth half as much again as the foregoing rates.

By the application of relative percentages in comparison with a well-known stone like Portland, the value of the labour on other stones may be easily ascertained and quickly priced. For example, the estimator can price all his labours at Portland rates, and either add or deduct a percentage according to the hardness of the stone employed. Thus, labour to Bath stone is 40 per cent. less, and Devonshire granite 50 per cent. more, than that of Portland. Bath stone and all labour compared with Portland is often priced at 25 per cent. less.

The following will give an idea of the comparative labour to a few important stones:—

	Per cent.
The labour on Ancaster stone is 40 less than that on Portland	
Ditto Bath stone	40 ditto ditto
Ditto Bosworth stone	33 more ditto
Ditto Bransley Fall stone	22 ditto ditto
Ditto Granite, Aberdeen	60 ditto ditto
Ditto Granite, Devonshire	50 ditto ditto
Ditto Parkeston stone	25 ditto ditto
Ditto Yorkshire stone	25 ditto ditto

Machinery.—A great deal of stonework, especially of the softer kinds, is now dressed by machinery; but the machines are chiefly employed at quarries where large quantities of stone are worked, and there are few builders who possess a large enough to maintain them. They would not only roughly dress stone, but will saw, rub, mould, and polish it, and the advantages over manual labour are great, the saving on this alone being at least one-third. There is also a large saving of time in production. The dressing of 30ft. of moderately hard stone by machinery will cost 2s., while the same by hand would amount to 5s. Machine-sawing for Portland costs 2d. per foot super, as against 5d. by hand, and machine-rubbing from 1d. to 3d. per square foot, according to the nature of the stone.

As for turning, a stone baluster 14 in. high by 6 in. diameter, with twelve mouldings on it, will be finished complete in a treadle lathe in half an hour, after first being roughed out on an octagon form. To work one of these by hand would take a good mason over three hours.

Waste.—The waste in the conversion of stone

depends upon its brittleness, and the irregular shape in which it is raised from the quarry, as well as upon the style of architecture. The full cubic quantity should be measured, from which the net quantity of material obtained from the length between the finished extreme points is taken. The waste on the conversion of loaded stone will be 10 per cent., and on sawn stone 5 per cent., which waste should be reckoned in pricing, notwithstanding the custom of measuring the stone net.

EXAMPLES: PORTLAND STONE.

Portland Stone in Block, roughly squared, including Carving to Size, Hoisting 30ft., and Setting as Lime Mortar.—This is for rough work, as for rubble walls, &c., and the six sides of the foot cube would be merely roughly dressed and squared. The blocks received in London usually average 20ft. cube.

Stone, in random blocks, delivered at London terminus, P.C.	s. d. 1 10
Waste, 10 per cent.	0 2
Carriage to site, say	0 2
6ft. super of rough dressing at 14d.	0 7
1ft. cube hoisting and setting up to 30ft., at 1d. per 10ft.	0 3
1 ft. cube lime mortar at 7d. per foot cube	0 0
Add 10 per cent. profit	3 11
Cost per foot cube	0 35

Ditto, but including Half-sawing to Faces, Beds, and Joints, and ditto.—As this block will be cut out of a larger one, there will be half-sawing this time to the six sides of the cube. The waste now allowed is only 5 per cent., because of the sawing.

Stone, in random blocks, delivered at London terminus, P.C.	s. d. 1 10
Waste, 5 per cent.	0 1
Carriage to site, say	0 2
6ft. super of half-sawing at 14d.	1 6
1ft. cube hoisting and setting up to 30ft., at 1d. per 10ft.	0 3
1 ft. cube lime mortar at 7d. per foot cube	0 0
Add 10 per cent. profit	0 42
Cost per foot cube	4 31

Coping, double-curved, 12in. by 4in. thick, Rubbed on Top and Two Sides, Throated both Edges, including Beds and Joints, and Set in Lime Mortar.—This would be for a 9in. wall, and as the joints

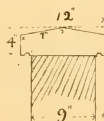


FIG. 2.

would be 3ft. apart, one stone of this length would be analysed as below. The dotted lines indicate the cubic contents out of which the block would be cut.

0 4 1 0	foot cube, Portland stone delivered, at 1s. 10d.	s. d. 1 10
0 4 1 0	Waste, 5 per cent.	0 1
3 0	Carriage to site, say	0 2
1 0 3 0	Bed.	0 0
2 3 0		
0 3 1 6	Sides.	
2 1 0		
0 4 0 8	Ends or joints.	
2 3 0	5 2 feet super, half-sawing to bed, sides, and joints, at 3d.	1 12
0 7 6	feet super, straight sunk face to weathering, at 1s. 2d.	4 1
2 3 0		
0 7	3 6 Weatherings.	
2 3 0		
0 3 1 6	Edges.	
5 0	feet super, extra only for plain rubbed work at 14d.	0 7
2 3 0 6 0	feet run thrust at 1d.	0 6
	1 foot cube hoisting and setting up to 30ft., at 1d. per 10ft.	0 3
	Line mortar at 7d. per foot cube	0 1
		8 11
		0 11
	Add 10 per cent. profit	9 10
	Cost per 3ft. run	3 31
	Cost per 1ft. run	1 10
	Equal to 0s. 10d. per foot cube.	

The most striking feature of the form of contract is the position of the architect. No one has a higher respect for the profession than we have; and we are prepared to prepare to claim for an architect the practical knowledge of the work that this contract requires. For instance, "The clay shall be dug where and to such depths as directed by the architect," "the turf on the top of the bank shall be removed by the architect," "the architect shall have power to direct the contractor to commence and proceed with or suspend the digging of clay as he shall think best, and the contractor shall forthwith comply with the directions of the architect," "The whole of the plant shall be placed as the architect may direct, and its position, when necessary in the opinion of the architect, shall be altered according to his instructions," "No bricks or plant, tools, or materials shall be removed from the site without the written consent of the architect," "The work shall be done according to the direction of the architect, and if the architect shall certify to the Council that the contractor has complied with the conditions of the contract, that the work is proceeding with due diligence, and that the Council may determine the contract, if the

What, under these conditions, would be the price any man could offer to make bricks for is quite beyond our computation. We are quite certain of this, that if there be any brickmaker so mad as to attempt to do so, the result will be fatal to himself and disastrous to the Council. The L.C.C. are proposing to go into such an undertaking, when, as a matter of fact, bricks can be purchased, either from Fletton or similar machine centres, or from the stock districts of Kent and Essex, at prices considerably below cost, and delivered at Norbury at shillings, we might almost say pounds, below the prices at which these bricks can be made for the L.C.C.

deductibles will be found to contain all the necessary

MESSRS. C. C. DINKERLEY AND CO., Ltd., Store-Street Iron and Steel Warehouses, Manchester, have issued a useful little catalogue of their stock iron and steel sections and manufactures—one of the largest and most varied stocks in the country—giving all particulars as to their weight, sizes, stock lengths &c. The new offices and warehouses of this enterprising company are models of modern construction, and are one of the best of their class in the kingdom. Photographic illustrations are given of the offices and warehouses in Store-Street. The warehouse devoted to joists, channels, beams, and other sections consists of two spans each 66ft. wide and 250ft. long, equipped with overhead travelling cranes driven by electric power, also a riveting department, and warehouses for bar iron, hoop iron, &c. The interior is fitted with a most efficient system of ventilation, size and completeness. The list of iron and steel sections and goods—laid in stock for immediate delivery—will be found to maintain all the necessities

The British Archaeological Association have just issued the programme of their 55th congress at Newcastle-on-Tyne. The meeting will last from Thursday, the 18th inst., to the following Wednesday. The first day will be occupied with the antiquities of Newcastle and the President's address, on the next Warkworth and Alnwick will be visited, on Saturday Jarrow and Tynemouth. On July 22 Cholliford will be the headquarters for the Roman Wall, and later Bead, Durham, Flodden, Hexham. The programme will be included in the programme.

Building Intelligence.

FOREST HILL, S.E.—The Duke of Fife, on Sunday afternoon, at the request of the London County Council, formally opened the completed museum buildings, library, and gardens in Lordship-lane, Forest Hill, which Mr. F. J. Horniman, M.P., has presented for the free use of the people of London. A Horniman Museum at Forest Hill, together with the free use of the gardens attached, has been known to the public since the summer of 1892, and the buildings have now been rebuilt from plans by Mr. C. Harrison Townsend, at a cost of between £40,000 and £50,000. The gift includes the grounds surrounding the museum, the house, and the gardens of the donor and his family. The museum and library stand by the London-road, at the foot of the Mount, and the rooms and galleries are filled with a collection of curiosities and illustrations of natural history, which Mr. Horniman has collected abroad in the course of the last twenty-five years. The books in the library, about 6,000 in number, chiefly relate to natural history and science, and there is a valuable collection of bibles. There is also comprised in the gift six residences, with 3½ acres of ground, producing an income of £600 per annum.

LAMBETH EMANCIPATION, S.E.—At St. Thomas' Hospital the other day, Lord Lister formally opened a new children's ward and an operating theatre. The former is fitted with Doulton tiles, with twenty-two picture panels in "Under-glaze Faience," representing various well-known nursery stories; the expense of this decoration has been defrayed by Mr. Stephen Holland, a governor of the Hospital, as a memorial to his daughter. The operation theatres are designed for the practice of strict aseptic surgery. The walls are faced with Keene's cement covered with white enamel, with shades of touch-proof glass. The pavement forms the floor, which is on a raised slope, so that the whole place can be thoroughly flushed with water. The auditorium is in four raised tiers, made solid of white marble, skeleton staging having been rejected on account of the danger of keeping it adequately clean and free from dust. The furniture is wholly of glass and iron. The subsidiary rooms, which are finished in the same style as the operating theatres themselves, include anaesthetising rooms, a sterilisation room, a surgeons' room, recovery room, &c. The cost of the new ward and theatres, together with that of the structural alterations now being made in the casualty and ophthalmic departments, is estimated at £50,000. Messrs. Higgs and Hall, of South Lambeth, were the builders.

LIVERPOOL.—A workmen's home and club and public hall are about to be erected on the site of St. James's Market, Great George-place, by Mr. B. M. Levy out of the moneys of the David Lewis Trust Fund. The building will be erected from designs by Mr. J. Francis Doyle, of Liverpool, and will occupy an area of 174 ft. by 146 ft. The style is a free adaptation of Renaissance. The materials used in the facing of the main outer walls will be a special brick and terracotta, with glass tiles on the roof. The main entrance is in the public hall and clubroom, which are from Great George-place, and will be 12 ft. wide, leading into an arched hall 50 ft. by 20 ft., finished in tiles and faience. The public hall, which will be 90 ft. by 50 ft. and 33 ft. high, will be in the centre of the building, and will accommodate upwards of 500 persons. It will have a stage, separate stage entrance from Rathbone-street, stage-boxes, gallery, greenrooms for both sexes, and eleven exits. All the staircases and floors will be fireproof. The social club will include a billiard-room 67 ft. by 22 ft.; two smoking-rooms, one with a fireproof main staircase, 21 ft. square, with a hall 21 ft. by 20 ft. The reading-room will be 50 ft. by 20 ft. In a central position between the dining and the dining-room, with an area of 200 ft. by 15 ft., will be the provision shop. There will be a billiard room, the shop with the kitchens in the basement. The dining-room, 80 ft. by 41 ft., will contain two ordinary fireplaces and a special cooking fire, with a lodgers' scullery. The kitchens, sculleries,

puntries, and stores will be in the basement. On the upper floors, approached from the large main staircase by three independent gangways, will be the sleeping cubicles, 381 in number. The work of erection, which has already been begun, has been intrusted to Mr. Isaac Dilworth, the clerk of the works being Mr. J. W. Gilling.

LONDON COUNTY COUNCIL.—At Tuesday's meeting of the Council, the resignation of Sir Alexander R. Binnie, who retired from office on July 1, 1899, in order to carry on private practice, after eleven years' service, was accepted, such resignation to take effect from Dec. 31 next. The finance committee presented its half-yearly report on works carried out by the works department, the approximate expenditure having been £150,000. The balance of cost under final estimate was £391, or 0.5 per cent. There were six cases in which the cost had exceeded the final estimate, but only two were considerable—viz., Redcross Fire Station, £1,023, or about 9 per cent., and Colham Buildings, £1,129, or about 10 per cent.; 523 works were executed at and on below schedule value of £1,207, and 621 works were executed at a cost above schedule value of £349, the balance of cost below schedule value being 6.9 per cent. The department had 29 works in progress (exclusive of jobbing works) at the end of the year, the estimated cost of £1,350, and there were 13 works not begun, estimated at £124,985.

MUSWELL HILL, N.—The foundation-stone laying of a Baptist chapel occurred on Wednesday last, July 3. The design was selected in a limited competition recently held. The main gable is flanked on the right by a tower, containing a spiral and weather-vane, and on the left by a dwarf tower, both of which contain fireproof staircases to gallery. A projecting narthex, containing main entrance to ground floor, forms a feature in front. A notable point on the plan is that the whole of the seating is arranged in a semi-circular form, so that the entire congregation directly face the preacher. The ceiling is vaulted in woodwork, with a central crossing between four wide arches supported on columns; this vaulting is surmounted by an octagonal dome, which conducts the foul air into a spiral and weather-vane, and is open through a patent air-pump ventilating flue on the roof. The baptistry is to be kept open, and is marble-lined, having a moulded oak handrail in front, supported by wrought-iron and copper standards on a marble curb. Ladies' and gentlemen's chairs and hanging screens are placed immediately behind the pulpit, and have direct access from baptistry under pulpit; this arrangement prevents the necessity of candidates passing before congregation after immersion. Deacons' and pastor's vestries are provided. A large school-room, with classrooms, ladies' working room, superintendent's room, infants' room, kitchen, heating-chamber, &c., is provided under the church, the level of land making this desirable. The materials to be used are red brick facings and Bath stone and Costessey dressings. The roof is to be slate. A special attention is given to the heating, the form of ceiling lending itself to as perfect a treatment as possible. The adult seating accommodation, reckoning 20 in. for each sitting, is about 472 on ground floor, 30 in choir, and 268 in the gallery. This provides for a mixed congregation of about 900 persons. The architects are Messrs. George Bailes, R.B.A., and Reginald Palmer Bailes, of 5, Clement's Inn, Strand, London, W.C. The contract has been let to Messrs. Mattock Bros., 219, Isledon-road, N., for £6,408 16s., the architects' estimate having been £6,780.

Mr. R. H. Bicknell, M.I.C.E., attended at the town-hall, Lowestoft, on Tuesday, to hold an inquiry into the application of the town council to borrow the sum of £57,000 for purposes of sea-defence.

On Wednesday week the Mayor of Todmorden set the first sod on the site of the new sewage-disposal works for the borough. It is at Sandbed, in the Todmorden valley, and will cost £65,000. The works themselves will be carried out on the Purification Society, and will involve a further outlay of £4,800. Messrs. Jones and Co. of Manchester, are the contractors.

A tablet to the memory of the late Sir Arthur Sullivan, presented by Mr. H. Lewis Doulton, will be placed by Sir George Cummings, on behalf of the Incorporated Society of Musicians, in the church of St. Lambeth, the birthplace of the distinguished composer, on Tuesday, the 20th inst.

WATER SUPPLY, PLANT, AND SANITARY REPAIRS.

GLASGOW WATER SUPPLY.—The Corporation of Glasgow during their annual inspection of the Katrine waterworks, last week, opened a new supply-lane, which practically doubles the flow of water to the city. The original undertaking was constructed in the year 1885, it was necessary to increase the supply, and another Act was then obtained authorising the corporation (1) to raise Loch Katrine another 5 ft., making 12 ft. in all that might be drawn upon for the purpose of the Corporation (2) to raise further 60,000,000 gallons per day for the supply of the city and suburbs; (3) to construct a duplicate line of aqueduct and service reservoir, with lines of pipes to the city; (4) to raise Loch Katrine above its present level, and lead the water from this loch into Loch Katrine by a tunnel. These works have now been completed. The first aqueduct from Loch Katrine to the service reservoir at Milngavie is 2½ miles in length; it is 8 ft. wide by 8 ft. high, with arched roof, and is capable of discharging 40,000,000 gallons per day. The second aqueduct, which runs almost parallel with the first all the way from the loch to the service reservoir, is 2½ miles in length; it is 12 ft. wide by 9 ft. high, with arched roof, where not lined with concrete, and 10 ft. wide by 9 ft. high, with arched roof, where lined with concrete, and is capable of discharging 70,000,000 gallons per day. The two aqueducts, taken together, are capable of discharging 110,000,000 gallons per day into the two service reservoirs, which are situated about seven miles from the city. The first reservoir, which would fill a canal 30 ft. wide and 6 ft. deep for 19 miles. The construction of the new aqueduct has taken from March, 1886, to June, 1901, to complete, 15 years. The Municipal reservoirs contain 21 days' supply of 62 acres, and a capacity of 500,000,000 gallons; and the Craigmaddie reservoir has a water-surface of 88 acres, and a capacity of 700,000,000 gallons. Combined, these reservoirs contain 21 days' supply at the rate of 50,000,000 gallons per day. There are four lines of 30 in. pipes from Mugdock reservoir and two lines of 36 in. pipes from Craigmaddie reservoir. The water from Loch Katrine is filtered, no filtration, being merely strained through fine wire gauze netting, to prevent sticks, leaves, &c., passing into the pipes. In order that the water might be kept free from pollution the fencing rights over the water-courses have been purchased from Loch Arklet, extending to 26,295 acres, were, in 1892, purchased by the corporation, at a cost of £17,000, and the owners of the land within that area were paid compensation for the loss of their buildings on any part of those lands. The cost of the new works is as follows:—Reservoir, £316,600; aqueduct, £730,640; outlet works and raising loch, £791; lands and compensation, £49,777; engineering, £21,582; total, £1,123,280. The new mains from Craigmaddie cost £116,126.

CHIPS.

An adjudication in bankruptcy has been against George William Brunell, of Broadstairs, surrey.

Memorial-stones were on Tuesday placed in position at Morbice, North Devon, as part of the new Methodist chapel, now in course of erection. The building, designed by Mr. W. H. Gould, of Ilfracombe, is being erected by Messrs. Britton and Pickett, at a cost of £1,200. It will be of the Gothic style, will measure 54 ft. by 31 ft. across, and will be built of Ivy House stone, with Bath stone dressings. There will be accommodation for 850 persons.

The sales at the Mart last week, as registered at the Estate Exchange (the same yard, amounting to £187,148. The figures registered in the corresponding week of last year were £214,908.

Colonel W. L. Coke, an inspector of the Local Government Board, held an inquiry, on June 25, into an application of the town council of Retford for leave to borrow £100,000 for the purpose of the drainage scheme. It was stated that the works have already involved an expenditure of £40,000.

The new buildings in connection with the church of St. James the Less, in the same road, were opened on Saturday by the Bishop of London. The buildings comprise classrooms, gymnasium, dispensary, nurses' home, schools, rooms for cookery classes, and other apartments. With the renovation of the church, and the new buildings, nearly £50,000 has been expended within the four years.

The annual examination in carpentry and joinery, promoted and held under the auspices of the Carpenters' Company, took place at the Carpenters' Hall on the 2nd day of last week. Although falling somewhat short of the total last year, the number of candidates (thirty-five) was quite up to the average of previous years.

Subscriptions amounting to upwards of £111,000 are now being received towards the Liverpool Cathedral scheme.

The annual dinner of the Royal Institute of Public Health will take place at the Whitehall Rooms, Hôtel Metropole, on Wednesday, the 21st inst., when the Harben Gold Medal of the Royal Institute will be conferred on Professor R. Koch, of Berlin.

Our Office Table.

Is a long letter to the *Manchester Guardian*, Mr. Lewis F. Day severely criticises the propriety of the action of the authorities at the Victoria and Albert Museum in accepting the gift of the collection of "new art" furniture recently made to them. A great responsibility rests upon the President of the Board of Education and his colleagues to exercise the strictest surveillance over whatever is shown in the galleries at South Kensington, and, as Mr. Day observes, the policy of admitting into the national collection work of living artists, and especially of producers entirely engaged in trade, is at the best doubtful. "Old work is, as he admits, not always good; but time has sifted it, and it upholds an ideal of art and workmanship which, in Mr. Day's opinion, competitive trade has done much to degrade. Surely, he asks, this 'new art'—a term in itself but the catchword of enterprising tradesmen—is not seriously accepted by the wardens of artistic education? He objects to this 'new art,' not because it is novel, but because it is neither sober nor sane. To 'use brass' thus, he says, is to 'furnish the nighbouring court, where stand the noble specimens of Renaissance cabinet-work temporarily deposited in its favour, is to emerge from nightmare into repose.'"

The annual exercise of the Architectural Association will take place this year from July 22 to 27, and suitable hotel accommodation having been found, the headquarters will be fixed in the beautifully-situated and interesting town of Cirencester. The visits will include the following: Northleach, Stowell Park, Chodworth, with its Roman villa and museum, Edgeworth Manor, Walsingham Manor, Lyppiat Park, Doughton, Malmsbury Abbey and Tower, Charlton Park, Beverstone Castle, Chavenage, Tebury Town, with its quaint market hall and old houses, Bibury Court, Abington Manor, and other places in the vicinity.

At the suggestion of the Bishop of Worcester, the sermons preached in many of the Birmingham and its suburbs on Sunday last, alluded more or less to the subject of the housing of the poorer classes, and particularly to the desirability of applying what measures may be possible for clearing out those insanitary nests of habitation popularly described as "slums." As was to be expected, the simultaneous pastoral efforts of the Birmingham clergy of all denominations were productive of no useful suggestions for the improvement of the housing conditions of the poor in what is claimed to be the "best governed city in the world." But Canon Robinson, the Rector of St. Martin-in-the-Fields, Rev. G. J. Emanuel, of the Jewish Synagogue, emphasised the fact that owners of slum properties are too often wilfully ignorant of the conditions of their houses, preferring to ignore their responsibilities and to leave everything to their agents.

The Inter-State Conference of the Australian Institutes of Architects, arranged for in Sydney during the Commonwealth inauguration celebrations last January, was opened on Tuesday afternoon, May 7, at the rooms of the Victorian Institute of Architects, Pleasance-buildings, Chesham-street. The delegates present were Messrs. J. Barlow, G. S. Jones, and H. C. Kent, from New South Wales; Messrs. S. Davies, A. B. Black, and H. L. Jackman, from South Australia; Messrs. P. Oakden, W. R. Butler, and M. Henderson, from Victoria; Messrs. C. W. Leslie, J. Carr, and R. C. Carey, jun., from Queensland. No delegates had been nominated by Western Australia. Mr. Percy Oakden was elected president, and Messrs. J. Little and G. S. Jones honorary secretaries. About forty members of the various institutes were also present. The report and draft articles of association for a Federal Institute, framed by the committee appointed at the Sydney Conference, were discussed. It was agreed that the title of the federated institutes should be the Institute of Architects of Australasia, and that it should constitute a body of architects, in accordance with, and of any others which may be formed in compliance with the rules and regulations of the Institute. The draft clause of the articles of association were subsequently discussed in detail.

The committee appointed by the congress of Australian engineers, architects, surveyors, and allied professions, which recently met in Mel-

bourne to consider the report upon matters relating to the selection of a site for the Federal capital, presented a series of recommendations to the congress. The recommendations gave rise to considerable discussion, and it was finally resolved: "That in order to secure the best possible position, before any site is determined upon for the Federal capital, an independent report be obtained from a commission comprising members of the engineering, architectural, and surveying professions, together with medical and business experts." "That it is important the Federal capital should be laid out in the most perfect manner possible; to avoid the mistakes made in many other cities by utilising existing buildings, it is desirable that for any site selected all obstructions that would in any way prevent the adoption of the most perfect design be removed." The resolutions have since been laid before the prime minister of the Commonwealth by a deputation appointed by the congress.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—St. Paul's Ecclesiastical Society. Visit to the Church and Ancient Rectory House of Southdown, conducted by the Rev. H. J. Clayton. Train leaves Holborn at 2.20 p.m.

MONDAY.—Clerks of Works Association. Monthly meeting. Carpenters' Hall. 7.30 p.m.

SATURDAY JULY 13.—Architectural Association. Visit to Marlow, to inspect works by W. H. Monks-Walker at Medley and Danesfield. Train from Paddington 11.15 a.m.

THE ARCHITECTURAL ASSOCIATION.

JULY 13. THE THIRD SUMMER VISIT, to inspect some specimens of Mr. W. H. MONKS-WALKER'S WORKS. Meeting at Marlow, Danesfield, &c. Members to meet in the Main-bus at Victoria Station, at 11 a.m. for 11.15 train to Marlow. P.O. for 4s. 6d. to be sent to Mr. H. Dymoke-Wilkinson, 34, Grosvenor-place, not later than 10 a.m.

R. S. BALFOUR, J. Hon Sec.
E. G. MAULE, J. Hon Sec.

The Wandsworth and Clapham Guardians have decided to proceed with the erection on land at Tooting of cottage houses for aged and infirm couples, at a cost not exceeding £3,510. The Local Government Board have already approved of the plans.

Colonel Durnford has held an inquiry at Andover, on behalf of the Local Government Board, into the urban district council's application for sanction to borrow £5,000 to complete the resurfacing of the town.

Kirkcaldy's grand new organ—a gift from Mr. Andrew Carnegie—which has been erected in the Adam Smith Hall at a cost of £3,000, is now finished, and the instrument has been opened this week. Mr. Hope-Jones, the builder, designed and superintended in detail the construction and voicing of the instrument.

The Local Government Board have forwarded their formal sanction to the borrowing, by the Corporation of Liverpool, of £50,967 and £12,400 for improvement purposes in connection with the widening of Berry-street and Renshaw-street.

A mortuary chapel with groined roof is about to be added to Hawarden Church, to contain, among other features, an altar tomb bearing the recumbent figures of Mr. and Mrs. Westlake, by Sir William Burges. Mr. A. A. A. factory is to be applied for to make the necessary alterations to the fabric of the church.

Mr. Walter Morrison, of Malham Tarn, Yorkshire, is building a memorial chapel for the use of soldiers, which is a gable-ended, as a memorial to the Diamond Jubilee of the late Queen. The chapel will cost £40,000.

A new mission church, called the Church of St. Michael and All Angels, has been erected in South Lynn, on the Middle-down-road, at a cost of £1,500, and attached to it is an infants' school costing some £900, the total expenditure being estimated at £2,500. The church, of Carr stone and red bricks, roofed with red tiles, will seat between 300 and 400 people, and the school is certified to accommodate 173 children. The church was consecrated last week by the Bishop of Norwich. Mr. L. F. Engleton was the architect, and Mr. R. Dye the builder.

The foundation-stone of a chancel which is being added to St. John's Church, Sevenoaks, was laid last week by Earl Stanhope. Mr. Hooker is the architect, and Mr. W. Wiltshire the builder.

The new police-court and station at Howden, which have been built by the East Riding County Council at a cost of £41,000, were on Saturday last opened for public business. The new structures occupy a prominent position in the centre of the town. They are built of red bricks, with stone facings.

Trade News.

WAGES MOVEMENTS.

BOX.—The strike of banker masons, which affects nearly 200 men, has now completed its fourth week, and at present there seems little hope of an early settlement. The masters have conceded the advance in wages asked for, and they have come to agreements with the men as to the relative number of apprentices to be employed, also the question of overtime. The contractors, however, refuse to be obliged to select apprentices from the sons of masons, and the master masons insist that they are required to terminate the agreement shall expire at any time of the year, and not in the busy months of May, June, or July, which the men demand. Every week the strike costs the dress-making industry, which has been built up after considerable expense and trouble, is gradually leaving the district.

BRADFORD.—There is likely to be further trouble in the Bradford building trade, as the masters claim are desirous of reducing the wages of the men by 1d. per hour.

BURTON.—On Monday evening the whole of the masons of Burton-on-Trent struck work for an increase of 1d. per hour. Their wages are at present 8d. Notice of their intention to strike was given, but demands were conceded was given six months ago. Not only the builders in the town, but the brewery firms, including that of Bass, Ratcliff, and Gretton, are affected.

CLEVEDON, SOMERSET.—The labourers' strike at Clevedon came to an abrupt termination late on Saturday night—through the intervention of the agent, Mr. Brabham—the men accepting the sum of 44d. per hour offered by the employers (an advance of 1d. per hour upon their former wage) until the late of June, 1902, when, it is stated, they will again demand the 5d. per hour upon which they struck this time.

Mr. W. Leicester, of Northwich, has been elected surveyor to the urban district council of Winsford.

New carved oak chandlers, which have been presented to the Corporation of South Newcastle, by Councillor W. J. Sanderson, were dedicated on Sunday. The stalls accommodate 20 boys and 20 men, and are the work of Mr. Ralph Helley, Newcastle, from designs prepared by Messrs. Hicks and Charlewold, architects, Newcastle.

The proposed new railway station in Sydney, N.S.W., designed by Mr. H. Deane, engineer-in-chief, will cover the whole of the sites at present occupied by the Devonshire-street Cemeteries, the Friends' Meeting-house, the Benevolent Asylum, Christ Church Rectory, the Convent and Home of the Good Samaritan Sisters, the police barracks, and the South Murrumbidgee. Within a few weeks the notice to these institutions to quit takes effect, and preliminary work in preparing the grounds for building operations will be started. Compensation to be given by the Government for the sites resumed is estimated to amount to £160,000.

At the last meeting of the River Wear Commission at Sunderland tenders were accepted for the supply of 12,000 tons of large rubble stone required for the Henslow foreshore barrage.

The Board of Agriculture has notified that the Ordnance Survey are issuing a map of Surrey and Sussex on the scale of four miles to the inch, price sixpence, or folded in covers, price ninepence. It is printed in black and white, with the main roads in colour, and will be found of great utility for general topographical purposes, but should also prove serviceable to cyclists and pedestrians, since it shows all the roads, indicating their character, rivers, towns, villages, and railway stations. Copies of this map may be obtained from the local agents, or through any bookseller, from the Ordnance Survey Office, Southampton.

An effort is to be made to repair the obelisk on top of Mool Fannam, Flintshire, a monument of the forthcoming coronation of Edward VII. This obelisk, which has long been in ruins, was erected by public subscription in 1810, to commemorate the jubilee of George III., and was originally 150ft. high, 80 ft. in circumference, and 10 ft. in diameter. It was erected from the designs of Mr. Thomas Harrison, of Chester.

The Sheppey Light Railway has been inspected and approved by the officials of the Board of Trade. The line connects the Sheppey Light Railway with the opposite coast of the island, and runs through the central districts of Sheppey.

Reopening services have been held during the week in connection with the enlargement of the Wesleyan Church, Park-street, Lybham. The church has undergone reconstruction, though the facade, which is one of the architectural features of the town, has been retained. The total cost of the enlargement is £6,000.

LATEST PRICES.

IRON, &c.

[illegible]

TIMBER.

Oak, Burmah	per load	£10 15 0	to £16 15 0
" Bangkok	"	10 5 0	13 15 0
Quebec Pine, yellow	"	2 17 6	4 15 0
" Oak	"	4 2 6	6 15 0
" Birch	"	4 5 6	6 10
" Ash	"	4 10 0	6 10
" Ash	"	4 5 0	6 5
Danish and Memel Oak	"	2 17 6	4 10 0
Wainsoot, Riga p. l.	"	2 7 6	3 12
Lath, Danish, p. l.	"	4 10 0	5 6
St. Petersburg	"	4 10 0	5 6
Greenheart	"	7 15 0	8 0
"	"	7 0 0	8 0
Sumatra, U.S.A.	per cube foot	0 9 9	15 0
Malagasy, Cuba, per super foot	"	0 0 6	0 0
Lin. thick	"	0 0 6	0 0
" Honduras	"	0 0 6	0 0
" Mexican	"	0 0 4	0 0
" African	"	0 0 3 6	0 0
Cedar, Cuba	"	0 0 2	0 0
" Honduras	"	0 0 3 6	0 0
Stains	"	0 0 10	0 0
Walnut, Italian	"	0 0 3	0 0
" American logs	"	0 2 3	0 0
Doek, per St. Petersburg Standard, 120—12ft.	by 14		
Quebec, 1 line, 1st	"	£21 5 0	to £29 15 0
" 2nd	"	16 15 0	20 15 0
" 3rd	"	11 5 0	13 15 0
Canada Spruce, 1st	"	12 0 0	13 15 0
" 2nd and 3rd	"	9 0 0	10 15 0
Riga	"	9 15 0	11 15 0
St. Petersburg	"	10 10 0	18 5 0
Doek	"	22 15 0	24 15 0
Finland	"	11 0 0	12 5 0
White Sea	"	12 10 0	22 5 0
Baltics, all sorts	"	7 0 0	10 10 0
Flooring Boards, per square of lin.—			
1st prepared	£10	6 0	£12 10
2nd ditto	"	0 10 0	" 0 12
Other qualities	"	5 6 0	" 0 13
Staves, per standard M.—			
U. S. 2nd	£37	10 0	£45 0
Memel, red pine	"	23 10 0	23 0
Memel, black	"	19 0 0	20 0

STONE.

Darley Dale, in blocks	per foot cube	£3 2
Red Mansfield ditto	"	£2 2
Hard York ditto	"	£3 2
Ditto ditto lin. sawn both sides, landings,	per foot sup.	0 2
random sizes	"	0 2
Ditto ditto lin. slabs sawn two	"	0 2
random sizes	"	0 2
Hopton Wood, Hard Block, in blocks, per foot cube	"	0 1
Ditto ditto lin. ditto sawn both sides,	"	0 2
landings, random sizes	per foot sup.	0 2
Ditto ditto ditto	"	0 2

All F.O.R. London.

OIL:

Linsed	per ton	\$32	0	0	\$32	5	0
Ilapased, English pale	"	27	0	0	"	25	0
Do., brown	"	23	0	0	"	25	0
Ilapased, refined	"	34	0	0	"	34	0
Olve, Spanish	"	38	0	0	"	39	10
Seal, pale	"	26	0	0	"	26	10
Cocacut, Cochín	"	29	15	0	"	30	10
Do., Ceylon	"	26	5	0	"	28	10
Palin, Lagon	"	23	0	0	"	23	0
Oleine	"	17	5	0	"	19	5
Lubricating U. S.	per gal.	0	7	0	"	0	8
Petroleum, refined.	"	0	0	64	"	0	63
Do., kerosene	per barrel	0	0	64	"	0	63
Do., Archange	"	0	19	6	"	1	0
Turpetine, American	per ton	37	0	0	"	37	5

The iron tubular bridge carrying the Midland and North-Eastern line over the River Aire, at Ferrybridge, was some time ago condemned by the Board of Trade as unsafe, and the North-Eastern Railway Company, whose property it is, are now preparing to entirely rebuild it, as well as the bridge over the road near by, at a total estimated cost of over £60,000.

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LIST OF COMPETITIONS OPEN.

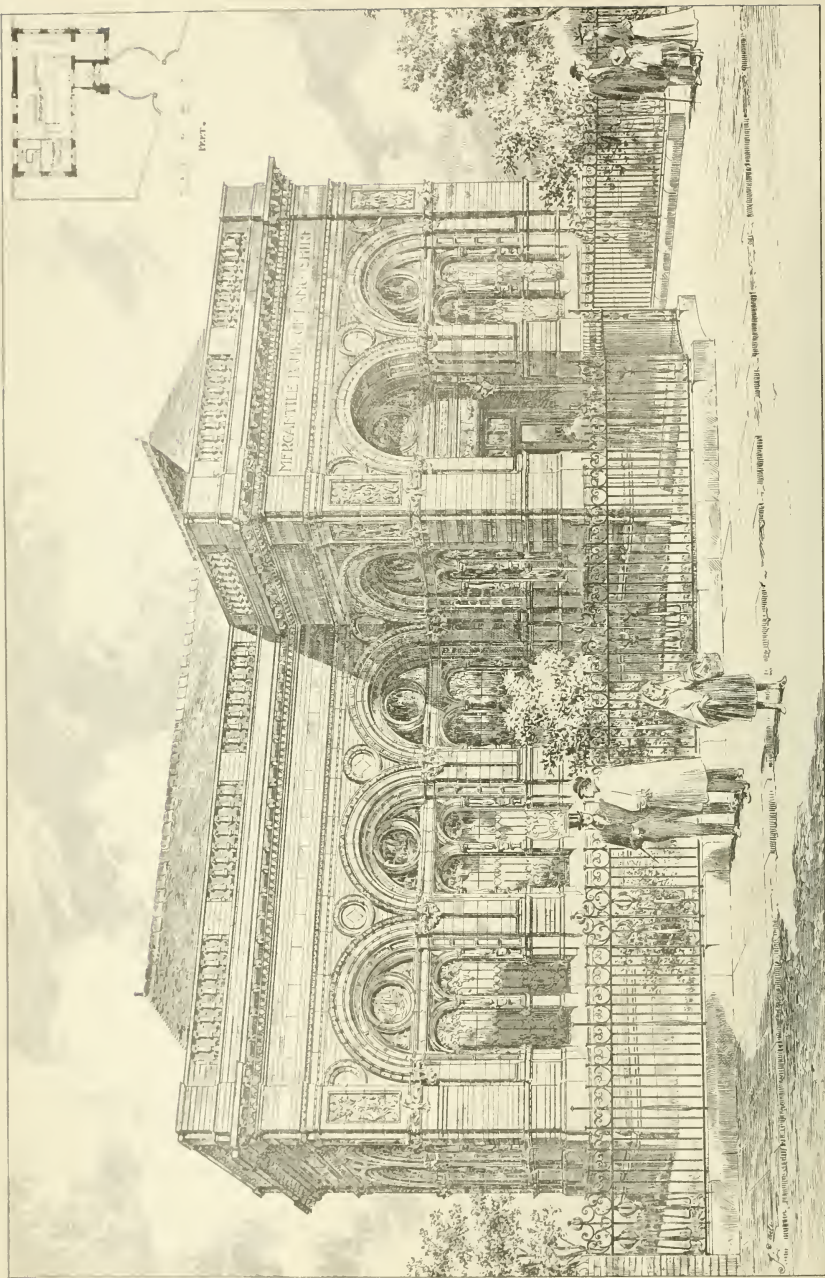
Widow—Gm-f-rs Ch-p-1 ord £800	£10 merged	E. Sholto Douglas, Clerk, Town Hall, Boxhill	July 18
Llanwrst—Market Hall, Council Chambers, &c., Market-st			
—on rent by lift, limit £2,000	£20	H. Pierce, Clerk, T.D.C. Office, Llanwrst	26
Man-hoist—Fire and Police Station, &c., £75,000 limit	£30, £25, £100	The Town Clerk, Town Hall, Manchester	31
Egremont—Masonic Hall	£10 10s.	James Lowery, 50, Main-street, Egremont	Aug. 1
Penryn—Leaving out ground on West End from the	£21 merged, £10 10s.	T. H. Corbett, Town Clerk, Public Buildings, Penryn	Sept. 1
Chelsea, S.W.—Public Health, King's-road	100gs. merged, 50gs., 30gs.	The Public Health Committee, 171, King's-road, Chelsea, S.W.	Oct. 1
Ilminster—Constitutional Club premises		John Blackwell, Barbage-road, Ilminster	
Ludlow—Twenty Workmen's Dwellings		John Gammage, Borough Surveyor, Town Hall, Ludlow	

LIST OF TENDERS OPEN.

BUILDINGS

St. Andrew's School, Glasgow	Durial Board	Henry Young, Architect, Midland-road, Bedford	July 6
St. Andrew's School, Glasgow	Durial Board	R. Horsfall and Son, Architects, 22, Commercial-street, Halifax	7
St. Andrew's School, Glasgow	Durial Board	J. S. Moffat, Architect, Whitehaven	8
St. Andrew's School, Glasgow	Durial Board	J. Twiss, Architect, Sandby	9
St. Andrew's School, Glasgow	Durial Board	D. Thos. Volk, Secretary, Clarendon-st., St. Dunmels	10
St. Andrew's School, Glasgow	Durial Board	N. W. Smith, 244, High-street, Teesley	11
St. Andrew's School, Glasgow	Durial Board	A. Chippendale, Lyndale, Harrogate	12
St. Andrew's School, Glasgow	Durial Board	J. Drake and Son, Architects, Queensbury, Yorks	13
St. Andrew's School, Glasgow	Durial Board	Devallion and Garden, 16, West-street, Aberdeenshire	14
St. Andrew's School, Glasgow	Durial Board	The Company's Architect, Cavendish House, Derby	15
St. Andrew's School, Glasgow	Durial Board	Wm. Powell, Pontliff, Wales	16
St. Andrew's School, Glasgow	Durial Board	T. Roberts, Architect, Aberdare	17
St. Andrew's School, Glasgow	Durial Board	H. C. M. Hirst, A.R.B.A., 30, Broad-street, Bristol	18
St. Andrew's School, Glasgow	Durial Board	The Secretary, 2, Texturthorpe	19
St. Andrew's School, Glasgow	Durial Board	I. Aled Jones, Clerk, Blaenau, Mon.	20
St. Andrew's School, Glasgow	Durial Board	Austin and Daley, Architects, Castle Hill, Lancaster	21
St. Andrew's School, Glasgow	Durial Board	R. Morahan, City Architects, Edinburgh	22
St. Andrew's School, Glasgow	Durial Board	Sansom and Cottam, Architects, Bridgewater	23
St. Andrew's School, Glasgow	Durial Board	Barber, Hopkinson, and Co., Architects, Keighley	24
St. Andrew's School, Glasgow	Durial Board	T. David, 23, Hampton-place, Hertford	25
St. Andrew's School, Glasgow	Durial Board	The Rev. L. P. Davies, Vicar	26
St. Andrew's School, Glasgow	Durial Board	Bailey and Son and Cabinet, Joint Architects, Kirdale	27
St. Andrew's School, Glasgow	Durial Board	C. Baker, Evans, 8, Queen-street, Carlisle	28
St. Andrew's School, Glasgow	Durial Board	F. Telford, Boro', Engineer, Municipal Buildings, Middlesbrough	29
St. Andrew's School, Glasgow	Durial Board	John Starnock, Secretary, 10, Clarendon-st., Edinburgh	30
St. Andrew's School, Glasgow	Durial Board	W. J. Jones, Beani School, Pontliff, Wales	31
St. Andrew's School, Glasgow	Durial Board	Thomas Hunter, Boro', Town Clerk, City Chambers, Edinburgh	32
St. Andrew's School, Glasgow	Durial Board	The Rectory, Llanthony, Wales	33
St. Andrew's School, Glasgow	Durial Board	R. L. Roberts, Architect, Victoria Chambers, Aberdeen	34
St. Andrew's School, Glasgow	Durial Board	And. Ferrier, Parish Clerk, Clarendon, Edinburgh	35
St. Andrew's School, Glasgow	Durial Board	T. Price, Governor, Pontliff, Wales	36
St. Andrew's School, Glasgow	Durial Board	Erbert Rushton, Engineer, Poplar-road, Cleeptons, Lanes	37
St. Andrew's School, Glasgow	Durial Board	Walter B. Wood, A.R.B.A., 12, Queen-street, Manchester	38
St. Andrew's School, Glasgow	Durial Board	Bedford and Kitson, Architects, Greek-street Chambers, Leeds	39





BRANCH BANK, WEST DIDSBUKY.

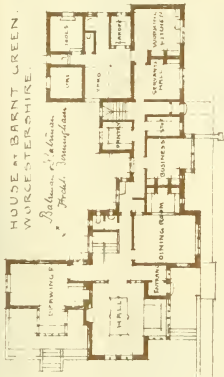


THE YOUNG NEWS, JULY 7, 1901.

OTTUMWA SCHOOL BOARD
GIRLS' SCHOOL BUILDING



Ernest R. Sutton, Architect



HOUSE AT BARNET GREEN,
WORCESTERSHIRE.

*Designed by J. N. Prynne,
F.R.S.A., Architect.*

FIG. 1. 1. 2. 3. 4. 5. 6. 7.





1890-1891



• DRAWN BY T. D. BRYAN •

PHOTO TINY*



THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXXXI.—No. 2427.

FRIDAY, JULY 12, 1901.

PLAN AND ENVIRONMENT.

CHARGES of unreality and insincerity are not infrequently brought against modern English architecture, and in some respects there is a ground for the accusation. Our public buildings are often more or less reproductions of ancient and modern edifices in at least their outward style and appearance. Again, we are in the habit of treating our materials in a manner that is quite a contradiction to their nature and properties. These things are a matter of constant reproach to the profession, but they have grown up in our daily practice for at least a century or more, we are indifferent to them. They have become a part of our education and our practice, and while we are compelled to admit the truth of the allegations brought against our art by declaimers opposed to traditional teaching, we appear to have little desire to revert to first principles. Owing to this repugnance to inquire into the logical basis of architecture, we have neglected methods of design that are of universal obligation, that ought to be put into operation every time we make a design for a building, or draw any detail or piece of sculpture or ornament. It is not only in the imitation of a style or the wrong treatment of material that we show our unreality and want of truth, but in numerous other things which lie at the fundamental basis of all good designs of every style. They are in short the application of taste and common sense, independent of style and of any special significance to every part and feature of a building. It has been the general presumption that by following a certain style or working in a particular phase of architecture, that we are bound to adhere to certain forms and types of detail, and that by so doing the architect is exempted from censure, although the conditions under which he works are not the same as those which governed the example he follows. Let us explain our meaning. We adopt as a model the elevation of some Italian palace, which has a certain aspect, say, south, that is of a certain height, and expresses the original designer's view of the purpose of the building. An English architect repeats the elevation, but without any reference to the aspect or situation; his work, perhaps, faces north; the building is half the height or size, and is intended for a commercial building in a narrow street. The result in every particular is a failure in an architectural sense; and we can wonder: The presumption of the copyist—or let us call him adapter—is that as he adopts the elevation as a whole, he cannot be wrong. Or, take a common example of misapplication. An architect selects a certain period of French Gothic. He takes a particular model, and bases his elevations and details on a typical 13th-century cathedral, such as that of Amiens or Coutances. He reproduces in some country church the attenuated shafts of the blind arcading of west front, the elongated spire lights that cluster round the base of the latter example, quite appropriate in the original example; in another instance he adopts more or less the rich traceried stonework of a Somersetshire tower for a building in Birmingham or London crowded with chimneys, in which all the conditions of bright skies and sunlight are reversed;—in short, having selected his style, he forthwith reproduces more or less minutely the mouldings, features, and ornament of some example in the particular period. The implication is that the selection of a style carries

with it all subsidiary details, all mouldings and ornament, no matter how different the circumstances are. What should he think of a reproduction of the rich traceried arcades of the Palace Ca d'Oro, on the Grand Canal, or the pierced arcades of the Doge's Palace of rose-coloured and white marble, in one of our smoky city streets? Yet we have reproductions of such façades in the Strand and Piccadilly. We find tracery and delicate low relief in the arcades and arch-mouldings of both those Venetian façades, and the chequer of coloured marble in panels and surfaces. Yet the old front of St. James's Hall is but a poor imitation of the first-named palace.

How often it is assumed that a building that is a success and economical in one locality will be equally suitable of reproduction hundreds of miles away in surroundings quite different! Some of our readers may remember cases of this kind. A public hall specially designed to suit a large town in Lancashire, where stone is abundant, and the accommodation required was—say 2,000 people, is reproduced on a smaller scale in a seaport town in the south of England, where brick is the chief material; the result is a failure. The plan is followed, and the construction and details reproduced with more or less likeness, but in a totally different material. The mistake in this case is the reproduction of a design on another scale and with different material; instead of having recourse to those principles of design which should govern and separate each case. The architect thought the same results would follow if he adopted the same plan and style—a mischievous delusion that has been found in other cases, such as selecting the design of a villa adapted for one situation, but quite ill-suited to another. In church building costly mistakes have been committed in this way, where a particular church has been taken as a model, but perhaps the wishes of the donor or incumbent—perfectly legitimate if the architect, instead of accepting the exact type of plan, had adopted the principle of the original builder so as to make it conform to the new site. He has instead followed his original too slavishly, while, after all, he has not worked on the same principles. Instead of consulting the site, or the contour and levels of his ground for the position of the tower, he simply copies the same arrangement, which is contrary to every rule of honest design. The same principles that governed his predecessor would probably have guided him to omit a tower altogether, and to adopt a bell gable or *flèche*, and they would in many instances have prepared him to surrender fine ornamental tracery where a bolder treatment was necessary.

We need not go into the arguments used by Professor W. R. Lethaby in his address before the Institute, showing that every old building in France, Germany, and Flanders was the work of masons, carpenters, smiths, and other crafts banded together as a guild. We cannot dispute the facts, but the whole system amounts to this: that each craftsman was guided by certain handed-down rules and traditions governed by common sense. It is questionable whether we shall again revert to the old *rigime* by means of schools and apprenticeships to guilds; but at least we can apply principles that were always held, and so try to bring back our architecture to the true system, in which workmanship is founded on an economic basis, and the thought of our designers again has free play. The present method of building is an architect's system, and the architect should be trained to direct John the mason and Bob the carpenter, as Mr. Leonard Stokes suggested. One directing mind was surely better than half a dozen craftsmen each trying to have his own way on a building and to dictate whether a stone

or a wooden roof should be put on. Organised guilds of craftsmen might have been able to dictate such matters; but we have no such assurance now, when the builder has passed into a contracting agent, and our workmen are controlled by trade-unions whose chief object is to keep up wages. At any rate, the architect should go beyond the walls of his office, learn construction on the building and in workshops, in contact with those who use tools and are constantly handling materials. Also, as Prof. Lethaby says, the mechanics of construction should be taught in a large way, not under dry and abstract book processes. The planning of certain kinds of buildings should be acquired in a practical manner by comparing results, while so-called "art" and "styles" would be relinquished to academical instruction and archeological science. The study of "style," as a means has been the potent cause of a great deal of the unreality in art we complain of. We have been studying styles as a kind of formula for designing all kinds of buildings, without reference to modern conditions of construction. It has been the main blighting influence of our 19th-century architecture, not seeing that it is the mere result of the work in any given age, and has tended to withdraw our attention from the building to its formal expression, like the study of costume apart from the uses of the wearer. We have now so-called "art furniture," "art pottery," "art metalwork," "art paperhangings," and what not, as if true art can be dissociated from any of these things, or as if "art" was something superadded to them to make them more valuable or saleable in the eyes of the public. This extraneous use of the word "art" or "style" has seriously lowered the standard of all our productions by giving them a fictitious hall-mark, and a quality to which they are not entitled. If the word was synonymous with "real" or "honest," it might be of some value. It would then be possible to gauge the pretensions of such a prefix; but the name "art" stands for so many visionary and unmeaning qualities when applied to furniture and decoration, that it lends itself too readily to all kinds of commercial dishonesty. As regarded by some of the dealers in Tottenham Court-road or Curtain-road, it may mean almost anything that is showy or a little out of the common, even down to the kind or colour of the upholstery, or the shape of a chair-back or leg. But the ordinary interpretation of the word means no more than this: that the furniture or decoration is in imitation of some period or style, such as the "Sheraton," or "Chippendale," or "Empire." It is so called because it has been made to imitate the work of those styles—in other words, art spells imitation in the mind of the average furniture manufacturer. We wonder someone has not introduced the prefix "art-buildings," for there is no doubt there are such buildings, the profession who enter into the same meaning of art when applied to buildings. There can be no reality as long as such ideas last, and therefore one way of correcting the abuse of the word is to drop it altogether, and speak only of truthful or honest design. Even the adjective "artistic" can be grievously misapplied. We speak of an "artistic building," or an "artistic" piece of woodwork as if it expressed some quality added to the building or work that can be bought for money, instead of really meaning that it has been honestly designed and carried out; in fact, what the newspaper critic may call an "inartistic building" or design may probably more truly express art.

A truer and healthier state of architecture would be brought about by reverting to principles and rules in building which we apply to nearly everything else. For some reason or other, architecture is one of the few pursuits from which we withhold common sense, and in its place we put a kind of capricious fancy or archeological sentiments

What has lately been called the "Syncretistic Style" expresses fairly this character of our architecture. Let us take a few of the more obvious principles based on actual data.

In the development of plans to meet certain requirements, we have a fundamental principle that is beginning to be better understood, though still far from being satisfactory. For instance, plans of public offices, law courts, libraries are sometimes reproduced in a locality for which they are not suited. The axes of the main rooms are not adapted to the site; the entrances, which were properly placed in the original building, are wrong in the new situation, and the windows suitable for one aspect are not necessarily so in another aspect. We may call this adaptation of plan to site. Then there is another principle that must be followed if we wish to produce good plans and agreeable designs: it is the relation of the parts and features of the building to the laws of perspective—the law of position. We sadly neglect this rule of the relation of parts to the eye. Though perspective as a science was imperfectly known by the Medieval architects, they nevertheless possessed the means of discovering by geometrical means the positions and relative heights of planes and features to the eye in their buildings. Were it otherwise, could we have possibly imagined such masterly grouping of parts that we find in Salisbury, or Canterbury, or Lincoln Cathedrals, to have been the result of chance; or would we have expected to see such beautiful and intricate arrangements of grouped and clustered buildings we meet with in the quadrangles of Oxford or Cambridge? Plain geometrical elevations could never have been relied upon for these arrangements, nor can we assume that model-were invariably made. The use of elevational perspective, or the perspective effects of the several sides of a building, gave the designers an idea of the effect of receding planes, their depression when viewed from a certain point, the return sides of buildings, &c.; and from old drawings and data it appears evident that the old architects or master builders made their elevations as they would appear from one point of sight, and not as seen at every point of its surface from a station exactly opposite, as, as we term it, geometrically—a most unnatural delineation when we come to think of it.

We here quote a passage of Viollet le Duc, who says: "The architect ought not only to possess a large acquaintance with descriptive geometry, but also to be sufficiently familiar with perspective to be able to draw a design, or parts of a design, in every respect. Perspective should be a practical science to him, to such a degree that in designing his geometrical projections he can realise in thought the effect which the elevation or elevated parts will produce at different planes of distance, the character of the site, the declivity of the roofing, the thickness of the walls, &c. When the horizontal plan had been determined, the old architects were accustomed to prepare a set of perspective elevations, and in this they proceeded wisely, and spared themselves deceptions. And if the practice of perspective is useful, that of marking shadows is not less so. Not, indeed, the conventional shadows mentioned by custom, but the shadows actually produced by the sun on the building in the place it is destined to occupy. The ancients and the artists of the Middle Ages and of the Renaissance paid attention to these effects; it is only in our time that architects have erected façades with a northern aspect, covered with delicate details in low relief, which the sun never deigns to bring into prominence, and which are consequently so much trouble and money lost. The Greeks took account of the light, and with what delicate feeling they took advantage of shadows! The artists of the Middle Ages were no less skilful in disposing the different parts of mouldings, of the

reliefs in the sculpture, according to the direction of the light. These refinements are, it is true, rarely understood in our days, and an architect never thinks of giving this reply to anyone who should ask him to reproduce in a northern aspect a façade whose effect is striking, because it faces the sun. The effect being constant, the effect which has struck you cannot be obtained here." He says nothing in reply; the façade is built, and the amateur who wished for its reproduction is greatly surprised to find a sombre, monotonous mass instead of the brilliant play of lights and shades which had charmed him. He calls the architect a blunderer—and the charge is not an unjust one."

One other kind of adaptation of plan to site was practised that the modern architect appears to have lost sight of—we mean the adaptation of a building to environment, to levels above or below the eye, and to surrounding buildings. A building on a hill of moderate height set off by trees or a background of foliage would look imposing, if not beautiful; but the same building set on level ground at a lower altitude would be unattractive, if not insignificant. The differing effects due to level or height above or below the eye are remarkable, as one may see by comparing the same building on different heights at the level of and below the eye. On ground level with the eye, the same edifice surrounded by lofty buildings will be quite insignificant compared with its appearance on the side of a cliff or seated on an eminence. We notice these differences more in relation to public buildings or the larger class of residences. Both the Ancients and the Medievalists made their public edifices large and more dignified than their domestic dwellings. The Middle Ages placed in its cluster of conventional buildings on one side, stood out prominently, and rose in dignified beauty from the mass of humbler dwellings that composed the city; but what would they appear like surrounded by lofty city warehouses such as those which tend to dwarf the proportions of St. Paul's Cathedral? Scale and dignity also characterised the great city halls of the municipalities in the Middle Ages, as we see them in Belgium, and to a lesser degree in our own country of more recent date. The effect of scale is neglected by the modern architect, who often copies a Classic building of one story or order that is nearly 100ft. in frontage in a plot perhaps not more than one-third the length; or, what is equally wrong, repeats to a smaller scale the single order of a well-known Italian façade, several times in height, in a street frontage. Proportion is not studied at all. In ancient times, and during the Renaissance, as we all know, proportion was made a definite study. The modern architect in his eagerness to establish absolute proportions for the Orders, though for the ordonnance they did not bind themselves. Several writers have shown how the triangle, especially the equilateral, was employed in setting out the proportions of columns and their intercolumns, the solids and voids of their façades. Thus in a building with columns and entablatures in one or more orders, the proportions of the heights of the columns in rows were in width and the voids between columns were determined by series of equilateral triangles, the base of each of which occupied the distance between every three columns, the apex of which gave the height of the order. In this connection we may also just refer here to the application of scale to the relation of parts of a structure to the eye—in other words, the relation of details like mouldings to the height of a building. We are occasionally astonished and disappointed to see rich and delicate carving in positions that remove it too far from the eye to discern distinctly without the aid of an eyeglass, details and carvings utterly thrown away.

The sculptor or carver has done his best to put as much detail into his work as possible, without for a moment considering the height it will occupy in the façade, probably below the cornice, or between the fifth and sixth-floor windows. In like manner we have ridiculed the pining proportions and elaborate memberings of the cornice to a lofty building, quite out of all proportion to the height, or, on the other hand, the coarseness and projection of moulded or carved capitals and stringcourses in churches, appropriate only to edifices of twice the height. Scale and the relativity of features to the eye make sometimes all the difference between the designs of a master and those of a novice.

THE COLUMN UNDER ECCENTRIC LOADS.

NUMEROUS investigations and theories have been broached on the probable strength of columns as affected by their proportions. Generally these investigations have been little better than displays of mathematical agility, or refinements that have no practical value to the architect or engineer, who wishes for a ready and simple means of determining the resistance of columns of certain sizes, and who desires a formula or formulae that can be understood by those who are not mathematicians. These formulae ought also to agree with the results of experiment, and be applicable to different materials; and we agree also with the author of the paper we are about to refer to, that the theory and formulae should have a wide range of application to cover the conditions of engineering practice, by introducing the values of the ordinary physical constants of strength and stiffness, and some satisfaction to be able to refer at least to a contribution that endeavours to comply with these requirements. In a paper just published in the *Transactions of the American Society of Civil Engineers*, the author Mr. J. M. Moncreiff, M.Am.Soc.C.E., discusses the subject in a very complete manner. His paper is a proof of considerable research and mathematical analysis, and we must therefore content ourselves with referring our scientific readers to the paper itself, entitled "The Practical Column under Central or Eccentric Loads." The principles upon which the author has based his theory are given as follows:—(1) "That a perfectly centred column of perfect material and straightness is an ideal conception seldom or never realised in practice; and (2) that the various disturbing influences preventing the realisation are practically all capable, as regards their ultimate effect, of being represented by an equivalent eccentricity of loading."

Both these are intelligible. We know that imperfection in casting the metal, defective bedding and jointing cannot be wholly eliminated; and the second thesis is also intelligible. Mr. Moncreiff says: "Any theory based on these principles ought to be identical in its results with the theory of the ideal perfectly centred column of perfect material and straightness, when the factor representing eccentricity is reduced to zero." Experiments have also established the fact that the physical axis of resistance in a column is not identical with the geometrical axis. The records made by Mr. James Christie, M.Am.Soc.C.E., the late Charles A. Marshall, and other members of the Society, show that the physical axis was found often to agree with the highest results. These experimentalists, in fact, proved that it was quite possible for a column to show higher strength when it was apparently loaded eccentrically, as compared with the strength when apparently loaded exactly over the geometrical axis, as in the experiments made by the same investigators named above. The application of this theory and resulting formulae to columns under appa-

rently central loading required a value to be assigned to the equivalent eccentricity, and for this purpose all the more important tests for columns were undertaken by those gentlemen. From a comparison of the tests by different experimenters, it became clear, the author says, "that isolated tests, or a set of tests, covering only a small range in proportions, as measured by the ratio of length to radius of gyration, or having only a scant number of tests at each ratio, could in themselves afford no reliable basis for use in practical work," and the writer says that any general conclusions drawn from such conditions are misleading. The author observes "too little emphasis has been credited to the probable history of the material and to the influence of apparently insignificant initial curvature in the specimens or small errors in setting in the testing machine." This divergence from theoretic standard may be due in the case of wrought iron and steel "to the effects of the inevitable cold straightening to which every bar, plate, or shape turned out of the rolling mill must be subjected" before being put into a testing machine. Iron used in ordinary construction is by no means equal to theoretic conditions: it is not free from internal stresses caused by cold straightening, or uniform in the elastic resistance of its sections. When such internal stresses, both tensile and compressive, are set up in the material by this and other processes, the consequences may considerably affect the strength, as has been proved by experiments on mild-steel columns of 30 diameters in length, where the resistance of "straightened cold" specimens was much less than of those treated by annealing and compressing the specimens. The "physical" axis of the column is thus made not to coincide with the "geometrical" axis, and the author remarks, "in forming a mental conception of the physical axis under these artificial conditions, we are driven to the conclusion that in practical work it can rarely, if ever, be a straight line." Machine riveting is another matter. The material of built-up columns, and the rivets, will produce internal stresses and cause the axis to bend.

We refer the reader to the paper itself for the mathematical investigation and formulae furnished by Mr. Moncrieff. He first shows that in order to develop a formula to express the strength of any column it is necessary to arrive at a formula to express its deflection under given conditions, and this is, of course, the bending moments imposed upon it, and these are simply determined. He proves that the relations between the stress diagram of a solid beam and the resulting deflection apply to the case of a column, and these are established by graphical means. The application of the beam deflection to the case of a column under an eccentric load with round ends is then given. On the assumption that the curve of the bent column is a parabola, the author gives the formula, which we will not quote here, but leave the reader to consult. Mr. Moncrieff's paper is of value; he endeavours to investigate the principles that should govern the designing of columns, or develop a practical theory of the strength of columns under central or eccentric loads, and he also justifies his formulae by giving the results of a practical experiment. As to the precise nature of the curve, it is immaterial, and of course with materials of varying kind, and imperfections of practice, it cannot be defined.

The author's investigation is one of value to the practical designer. Two modes of failure of columns have to be considered: one due to excessive intensity of fibre stress, and the other to instability. To those formulae (respectively numbered 7 and 2) we refer the reader. These are practically two expressions of one formula. The curves given in the diagrams are of interest, and the col-

lection of column tests in the paper is of value, giving the results of nearly 2,000 tests of columns by different experimenters. The author does not enter into the subject of column design, or the construction required to insure the full strength of the material—a matter of some value to architects. We have seen theories propounded very like those of the author; but he has at least given the student in this branch of analytical calculation, formulae for the proper treatment of columns and columns which practically obtain in most instances. These have been deduced from the actual requirements of practice, and as such they have a value of their own.

BOOKS RECEIVED.

Office Management: a Handbook for Architects and Civil Engineers, by W. KAYE PARKY, M.A., F.R.I.B.A., Bachelor of Engineering, and Examiner in Practical Sanitary Engineering, Dublin Univ., &c. (London: E. & F. N. Spon, Ltd., 1901.) The authors endeavour to formulate a system of office management for architects and engineers, and his labours will be thankfully received by many in the profession. Office management must, of course, be left largely to the individual. Some men have a method of conducting their business, and no set rules will be followed by all alike. The chapters deal with various subjects: diaries, letters, catalogues, drawings, specifications, estimates, agreements and contracts, certificates, the cost and cash books, day-books and ledgers, &c., in each of which useful and suggestive hints and observations are made. We are afraid many architects are not in the habit of using the "every-hour diary" introduced by the author, though many disputes would be saved if the habit was observed of entering details of the work as shown in the specimen page, where every hour from 8 a.m. to 6 p.m. is accounted for; seen at a glance. A "caller's book" is also useful if entered regularly, and so is the "attendance diary" for members of the staff to enter their names and hours. Many valuable hints are given on the method of keeping models, drawings, and drawings, and for an alphabetical file for drawings, also of presses for catalogues, that will commend themselves to the profession. Several useful forms are given for keeping and registering letters, a form of journal for entering orders and requests from clients or contractors, forms of certificates, of accounts, and a variety of others for business transactions. In businesses where the staff is large it is very essential to keep these books so that a perfect system may be maintained. The remarks on contracts, certificates, despatch of business, cost and cash-book, annual audit, will be found of value. We recommend Mr. Parry's book to all who wish to introduce a system in their method of conducting business, often sadly wanting. —*A Price Book for Architects and Engineers*, by T. E. COLEMAN, F.S.I. (London: and F. N. Spon, Ltd., Strand.) This is a very useful book. Mr. Coleman's "Price Book for Approximate Estimates," we noticed favourably. The author has here provided in the compass of an oblong pocket-book a general price-book for architects, engineers, surveyors, and others, based on established data and similar to the one being arranged in alphabetical order, any item may be immediately referred to and the approximate price found. Turning over the pages, for instance, we come to "Barnicks," where we find it stated: "Complete as for infantry battalion, including accessory buildings, roads, parades, gates, and water supply, drainage, boundary-walls, &c., £150 to £180 per man." We find such things as "bacteria beds" and "filters," "asylums," &c. The latter are priced at £25 to £30 per patient. As to the ordinary building trades, every item will be found in its right place. Thus, under "Battening" for Ladies' slating, 8s. per square; for Countess slating, 6s. for Duchess is, per square; concrete for foundations 1 part lime to 6 or 7 parts ballast, stone lime concrete 10s. 6d. to 18s. 6d., Portland cement concrete 13s. 6d. to 14s. 6d., concrete comprising iron or steel joists, concrete, &c., complete, exclusive of wood block or other flooring and plastering, not exceeding 18ft. span, 45 to 47 per square; exceeding 18ft. span, 45 to 49 per square. Buildings like baths and washhouses, labouring-class dwellings, hospitals,

asylums, board-schools, and hotels, items like "walls," "verandahs," "window-blinds," "tanks," "reservoirs," &c., will be found. The remarks on the preparation of estimates, and modes of estimating by rough quantities, per foot cube and per square, per unit of accommodation: the relationship of labour and material to the total value of each trade, and the table of average ratio of expenditure in the different trades, will be found of great value. The whole, Mr. Coleman's little manual will be found a useful form of price-book where approximate estimates are required. The price is 8s. —*The Village Church in the Olden Times*, by HARRY GILL, M.S.A. (Nottingham: J. B. Saxon, 1901.) This is an excellent popular account of the English village church, its associations and accessories. The author points out that while there is not now left to us a single building possessing all the features of pre-Reformation times, it is still possible to get a good idea of a Medieval village church was like by visiting one of the smaller and less known churches, and comparing the apparently untouched details in each with the inventories made periodically between the thirteenth and sixteenth century, and the returns sent by the churchwardens, every parish to Queen Elizabeth's Commissioners in 1562. The little book, which is published at half-a-crown, is bound in cloth, and is profusely illustrated with reproductions of photographs of churches, lych-gates, cressets, crosses, crypts, porches, open-air pulpits, and dedication stones, &c., arranged not in chronological order, but to portray the feature treated upon, and chiefly selected from the Eastern Midlands. A table of contents and index of illustrations add much to the usefulness of the volume for reference purposes. —*How to Become a Municipal Engineer*, by J. FREEBANKS SLOAN, C.E., Member of the Institution of Association of Municipal and County Engineers, &c. (London: The St. Bride's Press, Limited, Bride-lane, and New-street Hill, Fleet-street.) The author of this little volume attempts to explain in practical language the duties and responsibilities of a municipal engineer, pupil during the term of apprenticeship. The ends of the municipal engineer are kept in view. A good deal of the preliminary chapter deals with the importance of the profession, and is no doubt intended as a sort of encouragement to ambitious youths. Engineers are the pioneers of civilisation, and without them where would our splendid towns and cities of the present day be, &c., &c. There is some excuse for this strain of writing: it is flattering and stimulating to youthful minds. The necessary qualifications are sketched out. "For the youth," we are told, "whose mind tends to mathematics, geometry, and chemistry, has a taste for drawing and design"—very opposite and irreconcilable attainments we may say—"no professional holds out better prospects than that of municipal engineering." And then the student is told directly after, "Engineers are born, not made." The student statements are rather paradoxical. The student may say at once: If "engineers are born, not made," of what use is it to study for the profession? The author, however, gives many useful suggestions and directions for the artful pupil, about his home study, indentures, office, and office of books, and the excellent list of the Association of Municipal and County Engineers and the Sanitary Institute. A syllabus of questions, subjects as applied to municipal engineering work, including land surveying and levelling, hydraulics, sewerage and sewage disposal, water supply, sanitary matters, building construction, &c., is given, which will be found of use. Those who are to be apprenticed to the profession will find this little book a useful guide. The price is only 1s. —*An Itinerary of the English Cathedrals, for the Use of Travellers*. Compiled by J. A. G. GILCHRIST, A.M., D., Univ. of Iowa, U.S.A., revised and edited, with an Introduction, by the Rev. T. PRESTON, M.A., F.R.S.A. 40 illustrations and maps. (London: George Bell and Sons.) This little volume is a useful introduction, compiled for the use of tourists from the States, and is published as one of the series in Bell's and is published as one of the series in Bell's of this handy series of guides. The introduction on the cathedrals, by Mr. T. Perkins, is concise and fairly correct; but in the descriptions given of the English Cathedrals we find one or two omissions. Under Gloucester we find it simply stated that the spire was rebuilt in modern times (1866); but no mention is made of the name of

QUESTIONS.

REPLIES.

CHIPS.

At Uffculme, Devon, on Wednesday week, the Local Government Board inquiry was conducted by Mr. A. A. G. Malet, A.M.I.C.E., into the application of the Tiverton Rural District Council for sanction to borrow money for purposes of sewerage and sewage disposal for the parish of Uffculme.

Our Office Table.

MR. SPENCER CANNON, F.R.S.A., the surveyor of St. Paul's, states that the wall on which the cathedral is placed was never very good, and when it took his precautions accordingly. But even then the ground yielded a little under the immense weight of the dome and its supports. Had the school been left undisturbed, it may still have supported that no further movement would have taken place. At the bottom of the study-stratum and over the clay water is found, and thus, no doubt, was soon tapped as the business of the city increased. A source of great danger to the fabric of the cathedral was thus established. About 100 years ago great quantities of iron were put into the walls, the transverse were tied back to the dome piers, and also across their fronts in the direction from east to west. Since that time the south transept has shown strong indications of an inclination to slide southwards down the hillside towards the Thames. And not only these movements towards the south, but the wall has opened from east to west. This enormous wall, 8ft. to 10ft. thick, 130ft. wide, and of an equal height, is at this moment showing a tendency to move as above stated; and the movements are such that the breakage is gradually caused to be the thrusting of arches, but by the actual subsidence of the soil beneath. When we reflect continues Mr. Cannon, that there are now between the church and the river not only dykes, but the Underground Railway beneath Queen Victoria-street, and the Waterloo and City line beneath that, it is evident that the subsidence on which the ponderous masses of masonry rest has been seriously attacked. The west front, with its heavy towers and bells, has also subsided.

A SELECT COMMITTEE of the House of Lords passed, on Wednesday, the preamble of the Shannon Water and Electric Power Bill. The preamble, which is of importance on its bearing on the industries of the West of Ireland, proposes to incorporate a company with a capital of £200,000 and £180,000 borrowing powers, and empower them to carry out a scheme to utilise the waters of the River Shannon for the purpose of generating electricity for the supply of lighting and power purposes over an area of 30 miles radius from the power station to be situated on the banks of the river. The works to be constructed under the Bill consist of a short canal to carry the waters of the Shannon to the generating station to be erected at Clonman, where a fall of 40ft. is obtained. The water will be conveyed to the Shannon at a point six miles below the intake. The promoters expect to find their best customers among the industries of the city of Limerick, and have entered into an agreement to supply the tramway company of the city with energy in 1902, and it is expected that the corporation, who support the scheme, will also take the current necessary for the lighting of the city. It was pointed out that, in the absence of coal, much might be done towards promoting the industrial prosperity of Ireland by making use of its magnificent supplies of water power. The Bill has the approval of the Fisheries Board and H.M. Board of Works and private owners, and arrangements have been made for the construction of a weir to keep up the river and to provide for the supply of compensation water in the dry season. The Bill has already passed the House of Commons.

An exhibition of Scottish art was opened on Tuesday in the Sauchiehall-street galleries of the Royal Glasgow Institute of the Fine Arts. This exhibition is the result of a proposal put forward some time ago by the authorities of the Glasgow Art Club, and includes the work of Scottish artists, whether resident in Scotland or abroad. Organised by Sir George Reid, John Lavery, W. Q. Ormerston, R. C. Crawford, Miss Sansum, Dan, George Henry, J. M. McGeehan, and others, while the contributions in the other departments include examples by Joseph Henderson, A. K. Brown, George Houston, J. Morris Henderson, John Henderson, Colin Hunter, David Murray, E. A. Hornel, J. Reid Murray, George Pirie, Mr. James Campbell Noble, Hugh Cameron, Tassie Hunter, Willoughby Rattray, Robert W. Macdonald, William Kennedy, and George Cameron. The exhibition will remain open for four months.

The Science and Art Directory of the Board of Education, South Kensington, for 1901-2, August 1, Part 31, will this year be issued in two parts, July 1, already published, containing

the Code of Regulations, with appendices. The syllabus of instruction are under revision, and will be issued with Part II. The Code now in force, for the first time, regulations for the inspection of secondary schools under section 3 of the Board of Education Act, 1897. For "schools of science" inspection will be practically compulsory, inasmuch as by an addition to Regulations it is now made clear that any school for recognition as a school of science will be deemed to have applied for inspection of the whole school under the Board of Education Act, 1899. In this Regulation IV. (formerly XVI.) the definition of a school of science "has been amended by substituting for the words 'according to a course which has been specially submitted to and approved by the Board,' the words 'according to a course framed on somewhat similar lines' to the courses prescribed in the Directory."

The ancient churchyard cross of Flint is to be re-erected in its erstwhile position. A print of the churchyard which appeared in the *Gentleman's Magazine* of January, 1801, shows the shaft of the cross *in situ*, but with no capstone. The pedestal appears to have been a massive square block, chamfered, with a tapering octagonal shaft. The pedestal and shaft disappeared some fifty years ago, when the ancient church was demolished and a new one built. About the same time the capstone of the cross was given by the late Mr. George Potts Roskell, J.P., Skelvin, Hylwell, the then incumbent, to Flint. Mr. Roskell's widow died in July last year, and by her will she left the cross (which she had bought at Skelvin) to the Rev. Father Beaucher, a Roman Catholic priest, who generously restored the cross to the town.

The members of the National Federation of Building Trade Employers, of which Mr. A. Krauss, of Bristol, is president, met in Glasgow last week, and by a coincidence the Institute of Builders was meeting in the city at the same time. Both bodies were present at a reception given by the Lord Provost and ex-Bailie Shearer, and the courtesies of the reception were acknowledged by Mr. King, of London, on behalf of the Institute, and by Mr. Krauss for the Federation. The latter, in the course of his remarks, referred to the crowding of buildings in Glasgow without outside scaffolding, which process, he said, they had been unable to carry out in the South of England. The half-yearly meeting of the Federation was held at the Windsor Hotel, and several matters affecting the interests of the building trade were discussed, among them being the restrictions imposed by operative trade unions in regard to the fixing of ready-made joinery and worked stone which had been prepared in places other than those in which they were to be fixed. Members gave instances of operatives refusing to fix material which had been prepared in other districts, notwithstanding that the rates of wages in those districts were higher than in the districts in which the material was intended to be used. A resolution was passed expressing the opinion that the restrictions were an impediment to the progress of the building employers, but harmful to the general welfare of the trade. After the meeting the Scotch Federation entertained the members to lunch.

Accessions to the British commercial agent in the United States, the cement industry in that country is not receiving from British manufacturers the attention it deserves. The production of Portland and other cements in America is increasing, yet the importation is still small, and does not exhibit the decrease, among which had been anticipated. The demand for cement is increasing, for the long-standing prejudice amongst American engineers and contractors against the home product is dying out, and no doubt in time the country will supply its own requirements. In 1891 only 1,735 tons of cement used in the United States was of home manufacture, while in 1899 the proportion was 73.9 per cent. British cement has varied from 15 to 19 per cent. of the total imports since the beginning of 1899. Germany has the largest supply of cement in this country, its imports amounting to half the whole foreign imports. German cement is cheaper than the British, is more energetically advertised and pushed, and, some think, better in quality. Upon the last point, however, there is some difference of opinion. Belgian cement, though inferior to the British, has made headway, and makes its way on this account. Last year the total of the cement imported was little short

of 1,600 million pounds' weight, of which New York, San Francisco, and Baltimore took nearly half. In 1899 the total products of cement works in the United States was only 53 million barrels, valued at eight million dollars, being an increase of 53 per cent. in quantity and 55 per cent. in value over the previous year. The Lehigh Valley in eastern Pennsylvania is the chief source of the total products of cement (more than the rest of the country together). Two cement works there are said to be larger than any other in the world. One of them produces 8,000 barrels a day.

The Birkbeck furnishes a unique example of what can be done by a building society conducted on sound principles. In the five years from 1851 to 1856 its total receipts were only £23,600. Twenty years later the receipts for the same period had reached £139,000, while for the past five years they were £39,900,000, the total received during the fifty years being the enormous sum of 290,111 million pounds. The popularity of the institution is indicated by the fact that the register now contains the names of 15,129 members, and in addition there are some 75,000 depositors—in other words, there are over 91,000 persons financially interested.

CHIPS.

The partnership hitherto subsisting between T. W. Cubben and J. Cubben, architects, Manchester, under the style of Sankey, Cubben, and Cubben, has been dissolved.

The sales at the Mart last week, as registered at the Estate Exchange, amounted to £176,340. The registered value at the corresponding week of last year was £225,826.

The death occurred last week, at the early age of 49, of Mr. John Coad, builder and decorator, of 77, Fore-street, E.C. Deceased, who leaves a wife and three children, was a respected member of the Wesleyan denomination. The interment took place at Marylebone Cemetery, Finchley, on Friday last.

The Mayor of St. Helens opened, on Friday, the new Queen's Recreation Ground in Boundary-road, St. Helens, to acquire which the townsmen subscribed £10,000. The ground is 100 acres, and contains plots for cricket, football, bowls, and other outdoor games. It has an area of over twenty-two acres.

A new organ, built by Messrs. Nicholson and Lord, of Walsall, was opened at Tam Parish Church on Thursday last.

On Wednesday week, Dr. Whitehead, Roman Catholic Bishop of Liverpool, consecrated the church of St. Joseph, Skerton, near Lancaster, a structure built from designs of Messrs. Pugin and Pugin, London and Liverpool.

At the last meeting of the town council of Hull it was suggested that a plan for the new public hall should be thrown open for competition, but the Mayor said that the committee were desirous of keeping the expenses down, and their own city architect would be fully equal to the task of supplying them.

An extension of the Aberdeen tramway system came into operation on Friday, when the electrically equipped line from Castle-street to the east end of Constitution-street was opened, and the tramway is a mile in length, and is to fit into a section constructed on the third rail system which has been laid across the Links to the corporation bathing station. The cost to the tramway undertaking of this extension is about £16,000.

Buckfastleigh Urban District Council having applied to the Local Government Board for sanction to borrow £3,010 for purposes of water supply (including the construction of works in the parish of Buckfastleigh, West), Mr. A. G. Malet, A.M.I.C.E., on behalf of the Local Government Board, held an inquiry into the matter at Buckfastleigh Town-hall on Monday.

At the Guildhall, Exeter, on Monday, Mr. A. G. Malet, A.M.I.C.E., held an inquiry on behalf of the Local Government Board, in reference to an application by the Exeter City Council for leave to borrow an additional £13,000 for purposes of water supply.

At Farnworth and Jarline's periodical sale of furniture and fancy wares, held at the North Dock, Liverpool, on Thursday last week, there was sold, at the bidding of the auctioneer, a large quantity of Cuban mahogany, from St. Jago, containing 1,009 superficial feet, at the exceptional price of 13s. 3d. per superficial foot.

There have been hung in the Yorkshire Assize Court at York, last week, two engraved portraits, one of the Earl of Stafford, the other of Mr. Carr, the architect of the courts.

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ILLUSTRATIONS.

THE PASSMORE EDWARDS SAILORS' PALACE, FALMOUTH—SOUTH-WEST.
 THE PASSMORE EDWARDS SAILORS' PALACE, FALMOUTH—SOUTH-WEST.
 DRAWING ROOM, CAVENHAM HALL, SUFFOLK—WEST OF ENGLAND SKETCHES.

Our Illustrations.

THE PASSMORE EDWARDS SAILORS' PALACE.

THE foundation-stone of this building, which is the new headquarters for the British and Foreign Sailors' Society, was laid on Thursday last by His Grace the Duke of Devon, K.T., Vice-Patron, and the Right Hon. the Lord Mayor of London, Sir Francis Moon, Bart. The lease of the Shadowfel Institute has been taken for a term of 99 years, and it is no longer in the right place, for through dock extension, change of shipping, and other causes, that part of London is now more or less deserted by sailors. After 82 years' successful labour, the society found itself without suitable headquarters for the centre of its world-wide work. It was then that Mr. Passmore Edwards came forward to help a project which, when completed, will furnish the society with a home adequate to its needs, and so secure the permanence and progress of its work. Its position is unique. It will be situated at the junction of four main highways—East and West India, Commercial, and Barking-roads—with trams and trains passing all the time, surrounded by large Scandinavian, Asiatic, and German homes, which make it the very centre of Sailor-Town. The site is freehold. On the ground floor (following Miss Weston's experience) there will be the American room, restaurant and attendant's rooms adjoining. In basement: kitchen and store-room departments. The whole first floor (reached by the main staircase) will be the general offices, board-room, reading library, and literature departments. Second floor that will be officers' and apprentices' rooms, with parlour, sleeping accommodation, bath-room, and all complete. The next floor will contain navigation room, leading up to the observatory, with rooms for the superintendent and workers. East flat and room and bed will be another distinctive name. The main entrance will lead through a corridor into the Albert Victor Sailors Rest, in the Gill-street side of the Palace. Suitable panels, historic and emblematic, with libraries, will adorn its walls. Above this hall, with another entrance from Gill-street, are dormitories for seamen, with bath and lavatories complete. The lowest builder's tender of one eleven, which were all exceedingly close, was £11,555. This is for the building alone, not including the installation of the electric light, which would be £300, nor architects' fees, say, in round figures £12,000, towards which, Mr. Passmore Edwards has already promised £6,000. For the site which could have since sold for some £2,000 more than was given for it) and the equipment and endowment of the building, another £12,000 will be required. Messrs. Siven and Wigglesworth, F.F.R.I.B.S.A., are the architects.

According to the conditions (economy was to be rigidly studied. The design illustrated was estimated to cost £32,000; the design selected was estimated to cost £40,000 at a more expensive character throughout. The author of the second pre-arranged design is Mr. Arthur R. Mayston, A.R.I.B.A., of Great James-street, Bedford-row, W.C.

PITTMAN HILL, WARWICKSHIRE.

This house, now being built, is of brick rough-cast, with red tile roof, wood casement windows, and wood guttering and down-pipes. Internally the parlour is panelled, and the breakfast dining, and kitchen, are decorated in a similar way. Advantage has been taken of the sloping site to arrange the parlour with steps up to the main parts of the house, thus getting the room higher than the rest. The gardens are being laid out in a series of terraces and lawns, terminating in a pergola, &c., at the bottom. The house commands an extensive view over Edgell, the Warwickshire vale. The architect is Mr. E. Guy Dawkins, and the builders are Messrs. Fincher and Co., of Ely-street, Stratford-on-Avon.

DRAWING-ROOM, CAVENHAM HALL, SUFFOLK.

The panelling in this room is mahogany, with the mouldings and enrichments gilded in an old-gold tone; the larger panels are filled with a rich green silk material. The ceiling is treated with gold fruit enrichments in fibrous plaster, carried out by Messrs. Jackson and Sons, and modelled figures and other ornaments to the chimney-piece are by Mr. Taylerson from the architect's design. The room is 31ft. long by 17ft. wide and 12ft. 6in. high, and in addition there is a large bay window on the side opposite the fireplace. The architect is Mr. A. N. Prentice, A.R.I.B.A., of Hastings House, Norfolk-street, Strand, W.C. We gave a view of the exterior of the house in the BUILDING NEWS for June 2, 1899.

WEST OF ENGLAND SKETCHES.

"First Lin, Lost Out" Lin, Crosscombe.—Crosscombe, on the road from Shepton to Wells, is full of interesting old houses, among which the inn, dating 15th century, deserves especial notice. It has a remarkably good bay window, with moulded plaster ceiling. The exterior is built of stone, clear-washed; an octagonal chimney terminates one of the gable ends.—Crosscombe Church.—This interesting church contains an extraordinary amount of fine woodwork benches, and pew seats. The chancel screen is a fine example of Jacobean work. The tower is crowned by a wooden spire, a very unusual feature in this county. The arcades are perpendicular, and south door is Early English, but the mass of the fabric is 15th century.—The Palace, Ely, Wells, one of the four gateways around the cathedral green, and leading from the market-place to the Palace, is perhaps the stately of the whole series. It was erected by Bishop Bechington, and dates about 1470.—Shepton Mallet Church is cruciform on plan, with a good west tower of the Taunton type, crowned with an incomplete spire. The aisles and chancel have been rebuilt since the tower spire, from the pencil of Mr. Shirley Harrison, of Leicester.

Mr. Arthur T. Bolton, A.R.I.B.A., has been appointed Master of the Architectural Association of the County of Devon, which will be opened at 56, Great Marlborough-street, W., in October next.

A light railway connecting Laverdale district with the Edinburgh and Carlisle route of the North British Railway was recently opened for traffic. The line is over ten miles in length, and cost about £100,000. It is a vulnerable within thirty-two miles of Edinburgh and twenty-six of Dalkeith.

The Board of Trade have recently confirmed the following light railway orders:—(1) Mansfield and District Light Railways Order, 1901, authorising the construction of light railways in the county of Nottingham, in the borough of Mansfield, and the urban districts of Mansfield-Woodhouse, Sutton-in-Ashfield, and Hucknall-under-Hutwath. (2) Mid-Suffolk Light Railway Order, 1901, authorising the construction of a light railway from the Mid-Suffolk Light Railway Order, 1900. (3) Isle of Thanet Light Railways (Amendment) Order, 1901, amending the Isle of Thanet Light Railways Order, 1880. (4) East and West Kent Light Railways Order, 1901, authorising the construction of light railways in the West Riding of the County of York, from Rothwell to Hunslet, and the working of the East and West Yorkshire Union Railways as light railways.

PARLIAMENTARY NOTES.

HOUSE OF THE LANCING CLASSES.—On the motion of Lord Selborne, the House of Lords agreed on Monday to appoint a Select Committee to deal with a committee of the Commons to consider the question of the displacement of the working classes under powers conferred by private and local Bills, and Provisional Orders Confirmation Bills, and of securing their rehoming.

CHIPS.

Mr. G. Gard Prie, M.S.A., of 12, Paternoster-row, E.C., has taken Mr. V. F. L. B. to subject the law in practice at Hounslow, into partnership.

The Bill proposed by the Cambrian Railway Company for powers for extending their railway to Pwllheli has now been sanctioned by both Houses of Parliament.

The first section of the new Gifford and Gifford East Lothian, which passed a considerable portion of East Lothian to traffic, was inspected, on Tuesday, for the Board of Trade, by Major Ringie, R.E. The line, which has been in course of construction for fully two years, will be opened on Monday. At Pwllheli, the terminus at Gifford; but it will ultimately be extended.

At Bristol, on Monday, the Crissh Thomas Memorial Committee adopted plans prepared by Mr. T. H. Yabbicome, the city surveyor and engineer, for a drinking fountain to be erected on the triangular piece of ground at Black Bay Hill, on the city side of St. John's Schools, Bristol. It was decided that a bronze statue of Mr. Thomas should be incorporated with the memorial.

A new open-house in Bourke-street, Melbourne, built at a cost of £3,200, has just been opened. It is Moorcroft in style, and has been built from designs by Mr. William Pitt, M.L.C., of Melbourne, the architects being Messrs. Baxter and Boyne.

Messrs. Mark Fawcett and Co., of Westminster, have purchased some articles of furniture, of frontage to the river. They propose to remove their works there, and will build a wood-blo k factory and offices.

The new schools at Louthouse, near Wakefield, are being warmed and ventilated by means of short-circuit patent radiator grates, patent exhaust roof ventilators, and special inlet panels, the same being supplied by Messrs. E. H. Shortland and Brother, of Manchester.

The east end of the parish church of Seaton, near Stamford, has just been laid with stained glass, a memorial. It consists of three lights, the central subject being the Resurrection of Our Lord, and on either side the Raising of Lazarus and of the Widow's Son at Nain. Messrs. Heaton, Butler, and Bayne, of London, were the artists.

The Wallasey Urban District Council have approved a sketch plan, prepared by the district engineer, Mr. W. H. Travers, of the proposed recreation-ground between Demesne-street and Seacombe-promenade.

At the last meeting of the town council of Lancaster an important step was taken with regard to the construction of electric tramways on the overhead system within the borough. The electrical engineer submitted estimates for the construction of a line from the town-square to Scottforth, 14 miles, and from the Pointer (a third of the way to Scottforth) to the Golgotha entrance of the Williamson Park, 14 miles. The estimated cost of the line and construction of cars and a car-shed at Dalton-square was £28,000.

A new county bridge, which spans the River Derwent at Eddy's Ford, near Muggleswick, was formally opened last week. The structure rests on direct communication between the counties of Durham and Northumberland, connecting Muggleswick and Edmonbyers. The bridge, which consists of two segmental arches, 35ft. each, measures altogether (with the approaches on each side) 101ft. in length, 25ft. in height, while the roadway is 14ft. wide, the height of the span above the stream is 18ft. The bridge is constructed of rock-faced ashlar stone, obtained from a neighbouring quarry, and is built on concrete and concrete on a rock foundation. The facade is relieved by drafted stringcourses and copings and stepped cornices. The contract was let to the late Mr. Thomas Westgarth, of Toxteth Park, Liverpool, and carried out under the supervision of his son, Mr. Lawson Westgarth. Mr. C. Robb, of Newcastle, acted as clerk of works, and Mr. J. E. Parker, of Newcastle and Blackhall, was the designer.

The town council of Barnstaple have agreed to apply to the Local Government Board for permission to borrow the sum of £27,000 for the purpose of carrying out the electric-lighting scheme, and also that application be made for permission to erect private for the purpose of an electric-light station on the Council's premises in Castle-street and Commercial-road.

HEAD OFFICES OF THE NORWICH UNION LIFE INSURANCE SOCIETY, NORWICH.

The design illustrated obtained the second premium in the recent competition for the above.

BUILDINGS—*Contd.* from p. 109

BUILDINGS—Continued.	
New Motels, Five Houses Oaks & Oak Sheds, 4 Oaks, Three Tenants Owl—Bedroom, 100 ft. x 10 ft. Mason—Conservative Club Oak—Branch House, Louth Street Barnham, Extension and Addition to County Asylum Stanton-on-Wye—Reforms to Medical Officers' House New—Bedroom, 100 ft. x 10 ft. Port Talbot—Buildings South Shields—Alterations to Property Bosley—Farmhouse, 100 ft. x 10 ft. Criccieth—Lub and Hending House Walesfield—Two Houses, Arlinton Street Stockton—Farmhouse, 100 ft. x 10 ft. Chiver, House and Shop How Mills—Additions to House Lancaster—Barn, 100 ft. x 10 ft. St. Mary Bourne—House, 4 Hadam, near Southwell—Six Houses Cuckfield—Barn, 100 ft. x 10 ft. Fincham, Norfolk—Primitive Methodist School and Nottingham—Additions to Albion Schools Gillingham—Barn, 100 ft. x 10 ft. Northallerton House, 4—Thursford Wardley Bus—Brick Buildings and 1 Cottage St. Helens—Imperial Cement Works to 100 ft. x 10 ft. Burgley—Additions to St. Andrew's Boys' Schools Newcastle, Leake—Warehouses Watlington—Additions to Girls' School Donington House and Stable Sheffield—Bond Chimney London, S.W.—Ten Houses	Lowcock and Port Glasgow Tramways Ernest Printer Eatable Industrial Society Harris's Charity Trustees The Treasurer, 100 ft. x 10 ft. English Colonial Co. National Schools Managers Wm. Heath Bodley House, and (a) Blundell and Co. Gibbs, Mew, and Co. School Board School Board School Board

ELECTRICAL PLANT

ELECTRICAL FIRM.		
Steph. and. Fifteen Electric Tramcar Bodies and Equipments	Corporation	A. R. Pearnley, Tramways Manager, Brandon-street, Birkenhead.
Wicks, W. & Co. Electric Cables	Borough Council	W. A. Wright, Electrical Engineer, 37, Osborn-street, E.
Kirkaldy—Feeders, &c.	Corporation	C. Kennedy and Jenkins, 17, Victoria-street, S.
London, E.C. —Electric Motors	East Indian Railway Co.	C. Young Secretary, Nicholas-lane, E.C.
Dartford—Meters, &c.	Urban District Council	W. C. C. Hawtayne, 9, Queen-street-place, E.C.
Bradford—Electric Tramcars 100	Corporation	C. J. Spencer, Tramways Manager, 5, Foster-square, Bradford.
Talgarth—Electric Lightings of Asylum	Brecon and Radnor Jct. Asylum Com.	Giles, Gough, and Trollope, Archts., 28, Caven-st., Strand, W.C.
Amsterdam—Electric Lightings, &c.	Municipality	The Director, Municipal Tramways, Nieuwe Achtergracht, No. 164,

ENGINEERING.

Dechurdt, Hants.—Reconstructing Mews Bridge	Works Committee	W. J. Taylor, County Surveyor, The Castle, Winchester	July	13
Deerhurst, Angus.—Sinking Well, &c.	Urban District Council	S. Buchanan Smith, Solicitor, Crown Chambers, Salisbury		14
Deerhurst, Hants.—Rebuilding Pumping Station	Urban District Council	Grubbings & Baker, The Arcade, Salisbury		15
Little Bolas.—Bridges	Urban District Council	W. J. Taylor, County Surveyor, Shirr Hall, Shrewsbury		16
Chorley, Lancs.—Pumping Station, &c.	Urban District Council	Alban Jolly, Surveyor, 8, High-street, Chorley		17
Bruchell, Lincs.—L.C. & E. Extension	Bengal-Nagpur Railway Co., Ltd.	Langley, 1, Victoria Terrace, Shrewsbury		18
London, E.C.—Ten Six-Hundred Coupled Locomotives	Urban District Council	Sir John Wolfe Barry, 21, Delahay-st., Westminster, S.W.		19
Burnham, Ireland—Gas Plant	Urban District Council	T. Morgan, Town Clerk, Bangor, Co. Down		20
Castle, Lancs.—Laying New Main Water-Pipe	Town Council	James L.J., Engineer, 1, Cornhill, Works, Edinburgh		21
Chorley, Lancs.—Laying New Main Water-Pipe	Commissioners	Robert F. Miller, E.C. 106, Bath-st., Glasgow		22
Chorley, Lancs.—Laying New Main Water-Pipe	Town Council	H. E. Stillee, A.M.I.C.E., Borough Engineer, Town Hall, Dover		23
Chorley, Lancs.—Laying New Main Water-Pipe	Urban District Council	William Crozer, 1, Victoria-st., Shrewsbury		24
Kinston-on-Thames—W. and Steel Balconies to Infirmary	Urban District Council	T. Williams, H. Hope, E.C., Architect, Hampton Wick		25
Ashton-under-Lyne.—Washing Machines	Urban District Council	T. Williams, Clerk, Union Offices, Ashton-under-Lyne		26
Ashton-under-Lyne.—Washing Machines	Urban District Council	T. Douglas, 1, Victoria-st., Westminster, S.W.		27
Ashton-under-Lyne.—Washing Machines	Urban District Council	The Railway Director's Office, Christiania		28
Ashton-under-Lyne.—Washing Machines	Urban District Council	Francis W. MacNeil, Secretary, Harbour Office, Wicklow		29
Ashton-under-Lyne.—Washing Machines	Urban District Council	James L.J., Engineer, 1, Cornhill, Works, Edinburgh		30
Ashton-under-Lyne.—Washing Machines	Urban District Council	J. Taylor, Sans. & Santa Cruz, Civil Engs., 27, St. George, S.W.		31
Ashton-under-Lyne.—Washing Machines	Urban District Council	Henry A. Outler, A.M.I.C.E., City Engineer, Cork		32
Ashton-under-Lyne.—Washing Machines	Urban District Council	William Crozer, 1, Victoria-st., Shrewsbury		33
Ashton-under-Lyne.—Washing Machines	Urban District Council	J. H. Crowther, Great Falls, near Birkhead		34
Ashton-under-Lyne.—Washing Machines	Urban District Council	C. H. Passman, Clerk, 48, Bedford-street, Lexington Sp.		35
Ashton-under-Lyne.—Washing Machines	Urban District Council	William Crozer, 1, Victoria-st., Shrewsbury		36
Ashton-under-Lyne.—Washing Machines	Urban District Council	J. Lyon Whittle, Town Clerk, Warrington		37
Ashton-under-Lyne.—Washing Machines	Urban District Council	J. Stooke, Severn Valley, Shrewsbury		38
Ashton-under-Lyne.—Washing Machines	Urban District Council	H. Lewis, A.M.I.C.E., Municipal Offices, Victoria-st., Blackburn		39
Ashton-under-Lyne.—Washing Machines	Urban District Council	W. Stubbs, A.M.I.C.E., Municipal Offices, Victoria-st., Blackburn		40
Ashton-under-Lyne.—Washing Machines	Urban District Council	R. St. George Moore, M.I.C.E., 17, Victoria-street, S.W.		41
Ashton-under-Lyne.—Washing Machines	Urban District Council	M. Innes, Municipal Offices, Victoria-st., Blackburn		42
Ashton-under-Lyne.—Washing Machines	Urban District Council	F. Higginson, Engineer, Gas Office, Alexandra-road, Broadstairs		43
Ashton-under-Lyne.—Washing Machines	Urban District Council	The Borough Engineer's Office, Town Hall, Cropton		44
Ashton-under-Lyne.—Washing Machines	Urban District Council	Edward B. Polkinghorne, Engineer, 1, Victoria-st., Shrewsbury		45
Ashton-under-Lyne.—Washing Machines	Urban District Council	Edward Sharnan, Surveyor, Market-square, Wellington		46
Ashton-under-Lyne.—Washing Machines	Urban District Council	The Commercial Department of the Foreure Office, Whitehall, S.W.		47
Ashton-under-Lyne.—Washing Machines	Urban District Council	H. Ward, Architect, 1, Victoria-st., Shrewsbury		48
Ashton-under-Lyne.—Washing Machines	Urban District Council	Sir John Wolfe Barry, K.C.B., 21, Delahay-st., Westminster, S.W.		49
Ashton-under-Lyne.—Washing Machines	Urban District Council	J. Mansergh, Engineer, 5, Victoria-street, Westminster, S.W.		50
Ashton-under-Lyne.—Washing Machines	Urban District Council	Sir John Wolfe Barry, K.C.B., 21, Delahay-st., Westminster, S.W.		51
Ashton-under-Lyne.—Washing Machines	Urban District Council	John Holbrook, Surveyor, Heaton		52
Ashton-under-Lyne.—Washing Machines	Urban District Council	The Commercial Department, Foreign Office, Whitehall, S.W.		53
Ashton-under-Lyne.—Washing Machines	Urban District Council	Robert Roberts, Engineer, 1, Victoria-st., Shrewsbury		54
Ashton-under-Lyne.—Washing Machines	Urban District Council	Hamlet Roberts, Engineer and Manager, Town Hall, Ipswich		55
Ashton-under-Lyne.—Washing Machines	Urban District Council	Harold Jewons, Town Clerk, Wigan		56
Ashton-under-Lyne.—Washing Machines	Urban District Council	James L.J., Engineer, 1, Cornhill, Works, Edinburgh		57
Ashton-under-Lyne.—Washing Machines	Urban District Council	James L.J., Engineer, 1, Cornhill, Works, Edinburgh		58
Ashton-under-Lyne.—Washing Machines	Urban District Council	James L.J., Engineer, 1, Cornhill, Works, Edinburgh		59
Ashton-under-Lyne.—Washing Machines	Urban District Council	James L.J., Engineer, 1, Cornhill, Works, Edinburgh		60

FENCING AND WALLS

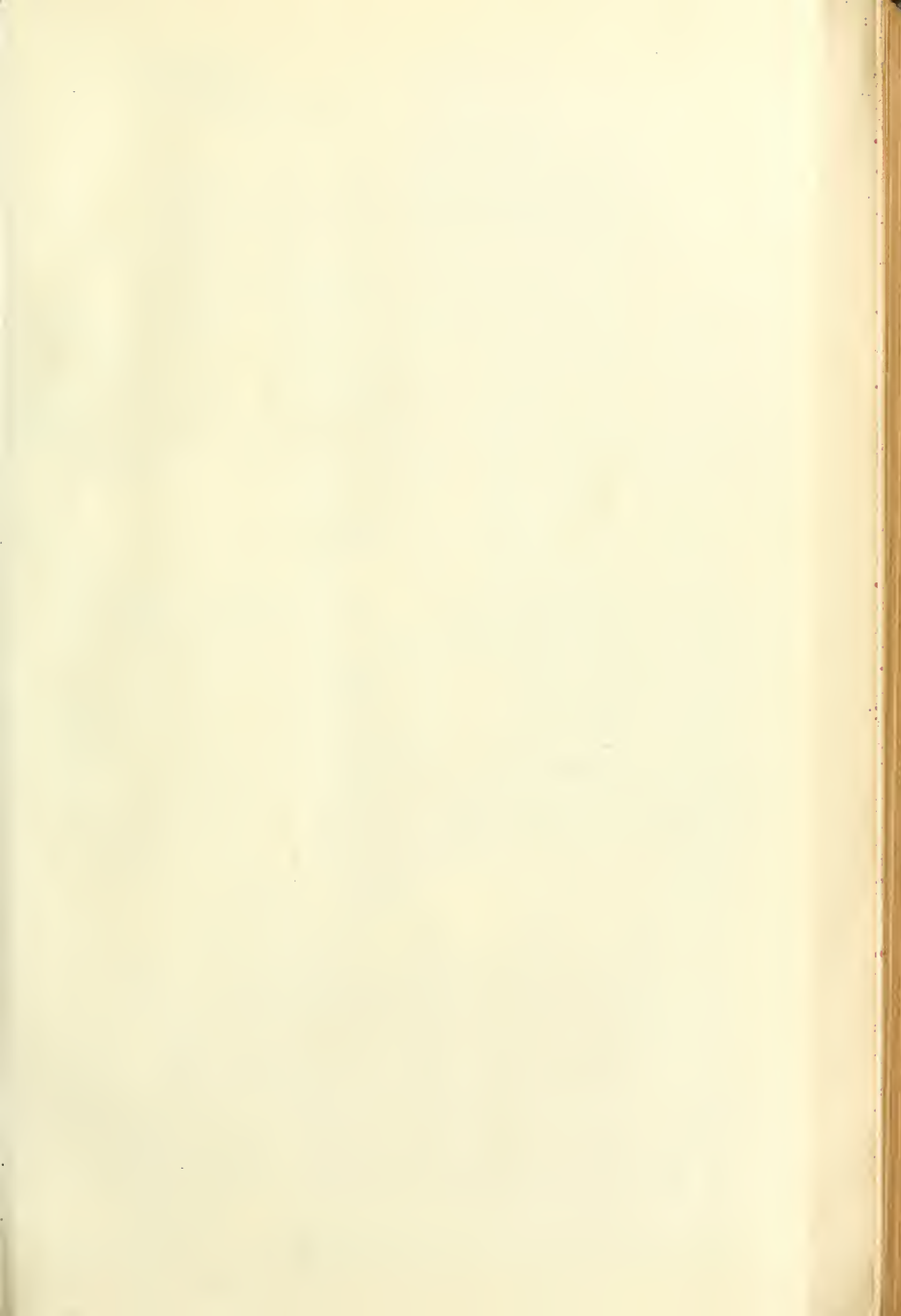
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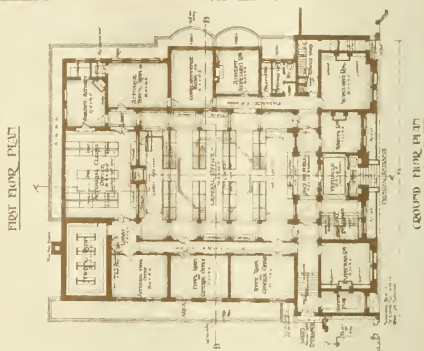
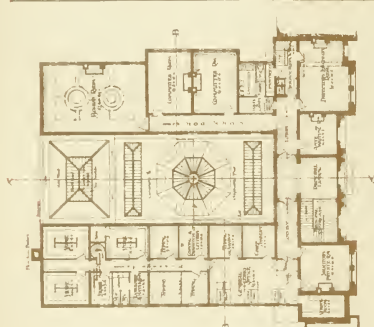
FURNITURE AND FITTINGS

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PAINTING.

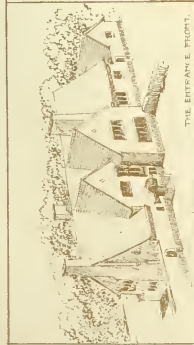
PAINTING.		
Clark—Various Properties	Corporation	A. C. Clegg, City Engineer, Guildhall, York
Arley, Leeds	Guidance	N. Trever, Clerk, Poor-Law Office, Derby
Armby, Leeds	F. W. Rhodes, M.S.A., Architect, Upper Wortley, Leeds	F. W. Rhodes, M.S.A., Architect, Upper Wortley, Leeds
Wardell, Thirsk School	Joseph Clerk, Clerk, Market-place, Dewsbury	J. Coward, St. Mark's Hall, Lake Side
Wortley, Cemetery, Leeds	Upper & Lower Wortley Burial Board	F. W. Rhodes, Architect, Upper Wortley, Leeds
Bradford, All School	School Board	W. Avery Adams, Clerk, Guildhall, Bristol
Bradford, Police Station	M. Nulik-Standing, Jt. Committee	A. Amey-Hunt, County Surveyor, Sudbury
Lezdon, E.C.	Bridge House Estates Committee	The City Surveyor, Office, Guildhall, E.C.
Hastings, Schools and Office	F. D. Board	P. O. Bisswell, Clerk, 18, Wellington-square, Hastings
Leeds, Church	I. D. Board	Waller and Son, Architects, College Green, Gloucester
Kirkstich—Various School	Health and Sanveining Committee	James H. Farquhar, Clerk, Abington
Leeds, Church	Guidance	Wm. Stubbs, Borough Engineer, Victoria-street, Blackburn
Newark—Infirmary and Office	School Board	H. H. Colton, Clerk, 28, Lombard-street, Newark
Barns—New Furness, Two Schools		W. Hutchinson, Clerk, 10, Colton Hall, Barrow



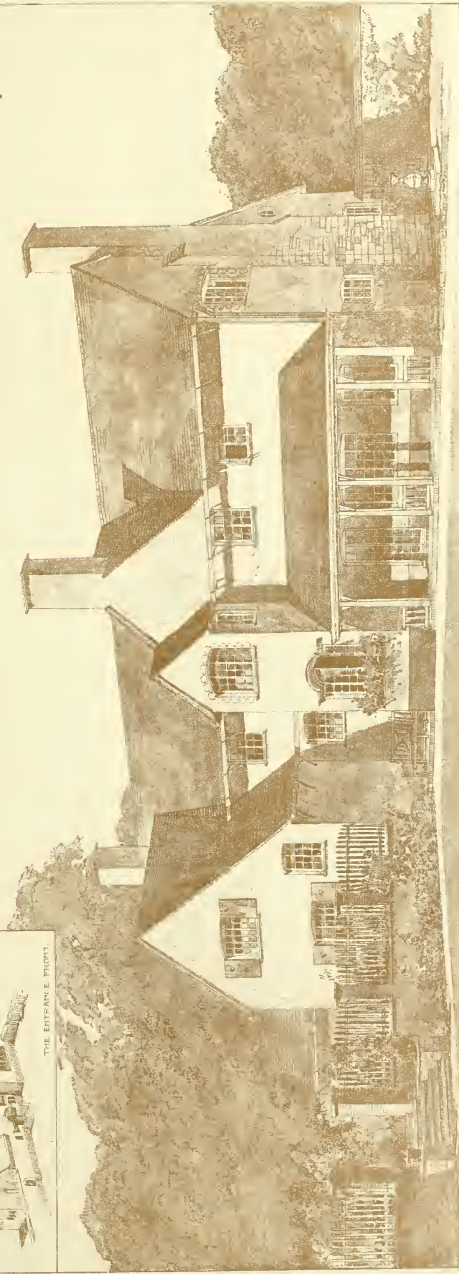


DESIGN FOR HEAD OFFICES, NORWICH,
OF THE
NORWICH UNION LIFE INSURANCE SOCIETY.
SECOND PREMIAED DESIGN - ARTHUR MAYSTON ARIBA-ARCAI

W. H. MARKING & SONS
PRINTED AT THE



THE ENTRANCE FRONT.



THE GARDEN FRONT.

PITEREN HILL.
WARWICKSHIRE.
E. GUY DAWBER, ARCHT.



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VOL. LXXXI.—No. 2428.

FRIDAY, JULY 19, 1901.

ARCHITECT AND CLIENT.

AN eminent writer has said: "The public never thinks; we live under the empire of general ideas; no one has confidence in himself"; but this statement can hardly be applied to questions connected with building, for we find among the less cultured classes that self-confidence is conspicuous. There are thousands of people who like to be their own doctors, who reject all orthodox teaching in medicine, theology, and architecture, and are only constrained by force not to trust their legal knowledge. It may be truer to say people live under an "empire of vague ideas." We find this to be true in the popular estimate of architecture as a profession perhaps more than in any other, for the average man thinks he has as much right to pass an opinion on a design or a public building as the most accomplished architect. Unfortunately, this self-confidence is detrimental to the profession and the progress of the art, for between the architect and his client there should subsist the most cordial relations. The client should place implicit confidence in his professional adviser, reliance in his skill and resources; on the other hand, the architect ought not to assume an arbitrary attitude; and should not be above consulting his client in every detail of arrangement and taste, and, in fact, endeavoring to bring himself to understand the habits and daily life of the client and his family. Questions and points of divergence that arise between architects and their clients are many, and we may note a few of frequent occurrence. Diversities of character are met with amongst all classes of men, and there is no wonder that we find similar differences in the profession. The conduct of the architect will vary according to his standard of professional class. How few men are able to resist or overcome by argument the likelihood of the tastes of their client—however wrong or ill-judged they may be. A wealthy client may come to his architect and tell him he wants his principal reception-rooms in a certain part of the house that may be the wrong side, and the architect yields, although he may express his disapproval; or a client requires the design of his new house to be in a certain style that may be repugnant to the taste of the architect, or may not appeal to him. How is he to act? He does not want to offend his client by refusing, however politely, to comply; he even may not care to discuss the objections he has to the style, but accedes to his wishes. But as a professional adviser, is this a right course to take? The architect is engaged to prepare a design—not necessarily one that his client may approve, unless there is a distinct understanding to this effect, but one which his own judgment and taste would approve for such and such a site. Upon this ground he ought to object to his client's opinion, and to persuade him by all the arguments he can to forego a style that appears to be unadapted or ridiculous. And this is the course that should be pursued by any other profession. If a medical practitioner was consulted about an ailment, the patient would not be so illogical as to lay down any conditions as to acceptance, or to say he must prescribe a treatment that would be suicidal, or perfectly absurd to say the least. Or, again, what a client would be so insane as to go to a lawyer for advice and then adopt a course of his own? Reasoning from an illogical, then, it is perfectly wrong in principle for a client to expect his architect to repudiate his own

skill and convictions, and to comply with other views; and equally foolish and reprehensible for a professional man to accept a commission under such conditions. Indeed it is unjust and unfair for him to take his fees for doing something that he knows is likely to cause inconvenience or discomfiture to his client, or to cause him to be ridiculed; unless he plainly submits to become merely a draughtsman for his client, and to wash his hands of all responsibility. But is the attitude of independence maintained by the architect? We are afraid it is not, for we have known of architects who have accepted commissions for buildings that have merely been put into shape by them, and who have so submitted their plans to others that they can scarcely be called their own. It may not, always, be a vital point that has been conceded, but still one upon which the external design depends; as, for instance, a room being turned another way from that planned, that has quite spoilt the external design or grouping, or a tower placed on the wrong side of a church just to satisfy the whim of a large donor. On the other hand, it may be a vital question of arrangement, which the architect should have declined to accede to without a written concession as to some suggestion or alteration that would alter the whole character of the design, or a violation of common-sense planning that would inflict a grievous wrong on the design for all time. The public are willing to impugn the architect's skill for any defect that becomes apparent—even a stuffy or draughty court or an ill-lighted or too-narrow staircase, or a badly placed door. He is accused and gibbeted in the public newspapers, or at a large social gathering, for a bad thing, or for a bad thing that perhaps ought to be laid to the charge of an official;—good reasons why he should uphold his opinion when he knows he is in the right.

The question is one of ethics. We hear it said sometimes that the client pays, and therefore he ought to have just what pleases him. But this view is opposed to the principles of professional independence, and reduces architecture as a profession to the level of a trade. It is true the client pays, but for what? He pays his architect, not for so much material and labour, not to make him a set of drawings to carry out his own ideas, but for a design based on professional skill and experience. The client comes to an architect for this purpose. Yet there is a good deal of confused opinion on this question. An American architect of some repute was asked in an interview the question: "Suppose a client comes to you, and desires you to design a building in a certain style that you disapprove of, or which you may not care to work in, how would you act?" "The house," rejoined the architect, "belongs to the client. He is the one who pays for it, and so is entitled to obtain what he seeks. Many things control the style that may be chosen, but, after all, the client's wishes are supreme. A good architect can produce a good building in any style." Such was the answer given by a well-to-do and busy architect in the States, and it fairly represents the opinion of a large number of building owners and architects in this country, who regard the matter simply as one of business, and that an architect should simply treat the matter in a commercial way, and accede to his employer's wishes as best he can.

The idea that an architect should treat styles as costumes, and be able to work in one as well as in another, is another common fallacy, and lies at the root of all that is dishonest and insincere in art. Those who follow this view of their business believe they are acting with perfect honesty, and they have not the slightest scruple in undertaking a building in any style that may be named—Greek or Japanese. Of course, such pretension as to knowledge of styles is, to say the least, a dis-

ingenuous role which very few of our leading men would care to assume. Even the examination or "registered" practitioner would be too modest to attempt to design in all the styles he had learned.

Then there is the client who knows too much, or a good deal more than is convenient, and he is a great trouble to the architect sometimes. A qualified adviser ought not to find a client of this sort troublesome. If the client really knows something of building, so much the better it ought to be for both; it is rather the ignorant busybody who really knows nothing properly, but is always interfering, that is the mischief. A well-known architect, asked upon this point, is reported to have said: "The architect is at his best when he works with a client who has a good general idea of the requirements." The client who knows what he wants and his own mind is a great deal better to work for than one who is quite ignorant, and whose expectations are in proportion to his want of knowledge. The man who knows something of everything, but whose knowledge is of the most superficial kind, is obnoxious, and such men are met with occasionally. But the competent professional adviser is not one to feel dismayed. Such a client soon begins to compare their relative standards of knowledge, and if his discretion is equal to the boldness of his attack, his assumptions soon subside. To what an extent an architect is called upon to accede to the wishes of his client in matters of which he ought to be the judge is also a moot question; we mean with regard to minor points rather than those relating to arrangement and style. Very often the building client may suggest a little alteration in the position of a room or a doorway, which, although not of great importance, may yet be not an improvement to the plan. The owner's wife often has an idea as to the conservatory or domestic offices that will spoil the elevation. These are details that must be considered on their merits, and if they can be met without any objection the architect cannot wisely refuse. There is some tact in giving way to the client as well as in "holding out" or resisting his demands. Of course, the professional man does not like "giving himself away," which he can do very easily if it is so obligatory, wishes to conciliate the employer or his "better half," or if he does not take the trouble to determine whether the proposed alteration is really an improvement or not. Nor does it do for an employer to find out that the architect has no ulterior reason for a certain arrangement, or has no reason to offer why it should be retained. The safest plan is to try and find out objectionable points in any proposed alteration, and to argue, nevertheless, that these should be retained, and that the client must not a retort or a strong remark, to urge against the architect's plan. It is undesirable to let the client think that a plan can be easily altered, for he is then apt to take advantage, and to suggest all kinds of so-called "improvements." In fact, a compact, ingeniously worked-out plan does not easily admit of alteration, and it appears to checkmate any deviation. On questions of taste, design, and decoration, some freedom may be allowed the client, so long as his ideas do not clash with the style selected or the principles followed. About such things as the patterns of ceiling decoration and papers, the colours of painting, and the choice of fittings, the taste of the owner may be consulted; but it is the architect's duty to advise and to prevent any glaring inconsistency being committed. On these points, although the proper verdict is "Let every man please himself," it is only a quietism or the unfortunate architect gets all the odium or discredit. Visitors exclaim, "What an atrocious thing!" pointing perhaps to a gas or electric-light fitting, or to the colour of the wall-paper. The architect gets the blame. The ordinary house-owner cannot stand

rebuke in matters of taste, and if a guest is bold enough to criticise the decorations, the reply is at once, "You must blame the architect." Such things as the pattern of a chimney-piece or ceiling, or the colour of a wall-paper, are personal to the owner: he thinks at once any censure is a reflection on his taste, and he is apt to throw the blame on someone else. As a matter of fact, there is much indifference exhibited amongst the profession as to fitting and decorations. Many in the profession are glad to leave these things to their clients, not venturing to exercise their prerogative in selecting or approving. Such an attitude of indifference towards details of the building does not help the architect: the client begins to underrate his design; he begins to think, after all, that it is a matter of personal taste, and in this was scarcely worth paying for. Directly a client begins to imagine there is nothing very definite in architecture; that there is no particular reason why a thing should be done one way rather than another, he naturally loses faith in professional assistance. No doubt it is the duty of the architect to safeguard his professional duties, to jealously uphold those principles and rules which pertain to his art, and not to allow his client to imagine that they are indifferent or matters of opinion.

There are many people who fail to see the value of an architect, and who consider him expensive and unnecessary. So could anyone who was well and could dispense with a doctor say of a medical practitioner; or anyone would think likewise of a lawyer over some trivial matter. People do not, as a rule, value anyone till they find they cannot do without his aid; so a great many who are about to build imagine they can dispense with an architect's assistance, and it is very hard to make them believe otherwise. Bricks and mortar look simple to the untrained eye, and put into shape as for plans and elevations, they appear easy enough. The difficulty of understanding how to build does not appear till one makes a trial; then he begins to think an architect's assistance is of use. So long as the ordinary client is unable to see any difference between Mr. Smith's, the builder's house, and a house designed by an architect, there is little hope of a real appreciation. Both buildings may be alike in cost and accommodation, both built of good materials; but one will flourish on examination better planning, better details, better decoration and fittings in the architect's work. But the difficulty is in assuring the client that these things are better; we can only do so by proving their superiority from actual experience. The architect may not be able to prove his skill in good arrangement or design so quickly or so palpably as the medical man can do by his medicine; it takes some time to prove the value of a certain arrangement or a certain elevation. Hence the architect's assistance is more slowly realised. This question is really a preliminary one to the others we have discussed; but we have endeavoured to show that the architect's tendency to "water down" his requirements, and his design to meet his client has the result of weakening the claims of his profession, and to put into the mouth of the would-be building owner the question, "What is the value of the architect?"

Certain distinct advantages ought to be shown by his employment. Does it always insure them? A man may have rather vague ideas about the soil, situation, aspect of a country house: it is for the architect to advise him. No doubt there are cases where a country client may have better and more correct ideas upon these points, than a town architect can possess. He knows the fall of the land, he is better acquainted with the views and prevalent winds, drainage, soil; and with such a client the architect ought not to be above asking information in these matters. He cannot be expected to have the same

experience with local conditions as one who has been living in the locality. Nor should he attempt to work independently. If he does, he will find all his skill in planning possibly wasted in wrong aspects to rooms, or in placing the main entrance in a position that would expose it to sundry inconveniences, and in selecting levels that will entail cost and discomfort. But generally these are matters about which the owner is very ignorant, and the architect's arrangements ought to be unquestionable. That they are always so we are afraid we cannot assert. Good planning ought, of course, to be insured by an architect's employment, and as a matter of fact it is, when he has worked independently and his plans have not been interfered with by ignorant busy-bodies. In question of external design, and details also, the architect's work can always be recognised, but unfortunately it is one of the least appreciated. Well-designed staircases and halls, doors and windows that show the designer's hand in every detail, and proportions that give pleasure and convenience, are regarded only by the few who have any discrimination and taste. So also in hygienic matters. A building which has been designed and supervised by a professional man ought to be at least equal, if not superior, to the builder's in all sanitary fittings and in heating and ventilating arrangements. These are points which the architect of to-day is called upon to insure, if unfortunate comparisons are not to be made, and if the profession are to retain their position in the eyes of their patrons.

CENTRAL SCHOOL OF ARTS AND CRAFTS EXHIBITION.

AMONG technical exhibitions, that held at the Crystal Palace at the London County Council's Central School of Arts and Crafts, 316, Regent-street, has a unique character of its own. It is free from the restraints of ordinary art education or the stereotyped forms which we have been accustomed to find. The School of Arts and Crafts encourages the more artistic class of tradesmen in the various branches of design and manipulation, and admission to its classes is extended to those actually engaged in these trades—not to the amateur students that are generally provided for in art schools. Its main object being to "encourage the industrial application of decorative design." One useful aim of its promoters is that apprentices to the trades should have the means of supplementing their workshop practice by learning all the other branches of their craft, which are now too often separated, owing to the subdivision of the trade. Thus, for example, in stained-glass work one man prepares the design or cartoon, another traces the lines on the glass, and a third does the cutting and leading of the pieces. It is quite impossible for the stained-glass student to learn his art properly without a knowledge of the lead lines in the plain and figure work, which are, so to say, the key to the design. The cutting and leadwork, by showing what is practicable in the arrangement of the pieces, influence the design. So with other trades. The subdivision of labour in factories has led to one part of a work being done by one set of hands, and another by a different set. Thus, in goldsmiths' and silversmiths' and jewellers' work, lads are kept to the making of one kind of article, and apprentices to these trades, when their terms expire, come out quite ignorant of the most elementary knowledge of their trade. The School of Arts and Crafts is established to give this elementary knowledge and to complete the instruction of the several trades. In one case, a lad of three years' experience as a silversmith's apprentice who was admitted to the classes, said that he had never had any instruction in smithing, but had simply been cutting and turning cones for pint pots.

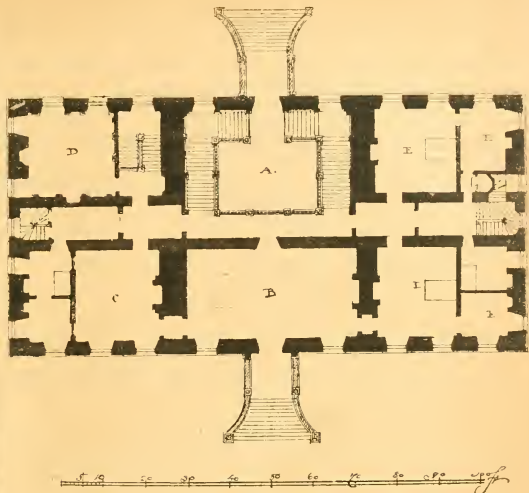
Let us briefly examine the work: and first we may notice the architectural designs. These are under the direction of Mr. Halsey Ricardo and Percy N. Ginhams. Here we find at least honest effort applied to buildings of modest every-day use, instead of to all kinds of pretentious edifices like cathedrals and Parliament Houses. A design for a public library, by Sidney B. Caulfield, in a plain, unostentatious treatment, with mullioned windows, shows, at least, common sense, if not any character or style. For a design for a country school and master's house three or four sets are seen. That by Chas. J. Bathurst exhibits a good plan: the boys', girls', and infants' cloak-rooms and entrances are convenient, and give access to schoolroom 32ft. by 20ft. 6in., and classroom 20ft. by 19ft.; the master's house is at one end, and infants' classroom projects at the other. White brick and slate roofs are shown; detail drawings to a large scale accompany the set. The design by A. C. R. Gill in red brick is simple and pleasing in grouping; the plan is well arranged in the main, with schoolroom 31ft. by 20ft., and classrooms at ends. We like also the design by F. G. Mitchell in red brick, with some of the windows breaking the eaves line and forming dormers. The plan forming a L block is skillfully managed. Another design is by S. H. Evans, and a simply-treated plan is that of C. B. Caulfield—the main schoolroom has a high hipped roof and projecting classrooms with verandah in front. The designs for cottage show a right motive and influence. The plan by F. G. Munt is faulty in the passage behind parlour. Another design of red brick, though with irregular plan, is pleasing in grouping, and we also mention the design by Geo. Albert Bryan. The authors have not been trammelled by style, but have shown what they could do by simple means. The architectural results, therefore, are straightforward and exceedingly simple drawings, and would not perhaps commend themselves to those accustomed to the work sent in for the National Competition prizes; but they are practical, and the details are all shown to a good scale. The designs for furniture of a plain, useful kind exhibit the merits of directness and purpose; there is no superfluous labour. Thus the solid wall dresser with oxidised copper fittings and inlays by A. W. Lamb, and a simple bedstead by A. J. Edwards, and their designs show effective work; so the inlay designs by W. A. Kruger and others show a fine adaptation of natural forms. Another department, that of wood-carving and gilding, chiefly represented by executed frames, is of interest. The trade at present has suffered also from subdivision of labour; but here the craftsman has set before him the complete frame, the whole process of designing, carving, and gilding being done by the same student. The simplest element that can be carved with the gouge, the "finger tip," and as soon as he has obtained a control over the tool and material, he is allowed to go to nature or to obtain his own motives. Some of the designs shown in which leaf patterns and scrolls are introduced treated flatly are very effective. We notice a frame with ivy-leaves by Miss Willis, and a casket by Miss Black, both displaying a skillful adaptation and treatment of natural forms.

The goldsmiths' and silversmiths' and jewellers' work, chasing and engraving, under the direction of W. Augustus Steward and others are the work of youths and journeymen. Many beautiful examples of hammered sheet-metal are shown in a case. One is a bowl and base raised by hammering to fit an old 14th-century knop fixed between the two. The engraving examples are also very good specimens in the modelling and casting metal. A decorative panel in white metal, by R. Downes, and the shield of the modelled from the flat and executed by G. Friend,

and the copper *repoussé* panels and frame are worth notice in this connection. This department is under Mr. Onslow Whiting. The stained-glass work, under the direction of Mr. Christopher Whall and A. J. Drury, is a very interesting exhibition. The work shown here is done by students who have learned their complete craft, as we have said, to make patterns of quarries, the cutting as well as leading. The executed work, such as the figure of "Charity," by F. Brett, and designs after Burne Jones, a copy of 13th-century plain glazing, panel in grisaille, subject "Adam and Eve," after Burne-Jones, by H. R. Hardy; and Miss Chaplin's glass-work, copied from a Japanese colour-print, are results of this instruction, for which there are special advantages offered in teaching the elements of design and original compositions and figure subjects.

In enamelling, some very beautiful and promising work is shown. This is under the direction of Mr. B. Nelson and Mr. R. D. Winter. We notice the elegant necklace designed by W. S. Hadaway, and work by Miss E. Virtue and Miss B. Tait. The necklace and pendant of painted enamel, by Miss Hildesheim, and a waist-belt in copper enamel, by Miss C. Adams, an enamelled bookcover, by W. R. Parkinson, &c. The works are executed by students who prepare the metal, make their own designs, and do the enamel work.

The decorative black-and-white designs—such as borders for pages, initial letters, &c.—are numerous, and show some good motives and treatment. The sketch designs include some clever adaptations of national foliage and flowers—such as a wrought-iron grille, with brass flowers, some tile patterns; also some new treatments of foliage for decoration, an embroidered silk bell-pull with flowers conventionally arranged on a blue ground divided by strips of purple silk into long panels by Chas. J. Bathurst; and a stencil design for matchboarding. The woodcuts in colour process are shown by several examples, and a set of blocks for printing different colours, and the effects are broad and adapted for decorative purposes. We also notice some very good examples of lithographic drawing done by students, who not only make the drawing on the stone by means of litho. chalk or ink, but who produce the print. These are really auto-lithographs;—the process is not laborious, and is well adapted for artists' own productions. In ordinary lithography the designer rarely touches the stone. The bookbinding work is represented by many beautiful examples of design and execution, and in this staff the students are taught to learn every part of the trade, from sewing to finishing, and the designs are in many instances suggested by the tools used, and are of great variety. The drawings for children's pictures, by Mabel Harwood; the embroidery work, directed by Miss Ellen Wright and Miss May Morris; the textile designs, printed fabrics, and carpets—one in a rich peacock-blue colour; the designs from the figures and from crests, and the nature studies, are departments of the work done in the school that exhibit a right influence. The studies for ornament are based on natural forms. All engaged in building work architects, builders, modellers, carvers, decorators, metal-workers will find the school instructions complete. In the architectural designs and workmanship the treatment is based on the facts of modern life rather than tradition and styles, and we do not think the architect's pupil can find a better preparation for learning the trades. There has been an increase in the number of students, the last season numbering over 700; and we hear the County Council have agreed to erect a new building in Southampton-row for the purpose of providing for the greater accommodation required. The exhibition has been well arranged by Mr. C. W. Beckett, the curator.



COLESHILL, BERKSHIRE.

A, the Hall; B, the Salon; C, Drawing-room; D, ParLOUR; E E, Bedrooms.

acting on behalf of Mr. G. Frampton, A.R.A., and Mr. W. B. Lothaby, the directors of the school. The exhibition will be opened to the public throughout the week.

INIGO JONES' ARCHITECTURAL WORKS.*

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

ONE of the most thorough and practical works published during the heyday of the Gothic Revival was the large folio by William Burgess of measured drawings of French Medieval work. There were many others of a like kind; some of which, coming out in the earlier days of the movement, though more mechanical and perhaps less reliable, had a far larger circulation and greater influence, such as it was, upon the fashion of the day. That fashion worked itself out for the time being, and gave place to another revival which was inaugurated by the erection of a series of houses and schools in what was known as the style of "Queen Anne," or "Dutch William," as the term goes. Books of measured drawings of Italian Renaissance and of Spanish work, with a view of adding a Continental flavour, so to speak, to the more prosaic mannerisms of the so-called Free Classic; volumes of photographs, interspersed with plans, as in Gatch and Brown's "Renaissance in England," and in Belcher and Macartney's "Later Renaissance," followed, while Bloomfield's two volumes on the "History of the Renaissance in England," and Birch's "City Churches" show much of the grand ecclesiastical design of Sir Christopher Wren. Inigo Jones naturally enough is more or less represented in these works so far as they treat of his period; but till now no volume has been exclusively devoted to representing the more characteristic and important buildings carried out from the designs of the first English architect who realised in his works the charms which undoubtedly belong to the Classic Renaissance. With an individuality all his own, he inspired his conceptions with imagination, and at the same time restrained his freedom in design with the refined limitations of grace and true proportion. Inigo Jones is familiar to all students of architecture as a foremost personality

of his day, as one of the greatest of modern British architects, and as the forerunner of Sir Christopher Wren. His works are less known, and when illustrated, they have for the most part been very inadequately represented by reproducing old drawings of indifferent woodcuts, or by reprinting comparatively poor photographs. This deficiency has been supplied by Messrs. Inigo Triggs and Henry Tanner, Jun., who, with considerable industry, have visited no less than fifty buildings either in part or wholly attributed to Inigo Jones, and they have made a series of measured drawings and sketches of the more important of his known designs. These studies, all shown to a good scale, have been published by Mr. Batsford under the title of "Some Architectural Works of Inigo Jones." Their volume is capably produced, including some few general plans and several general elevations, which are amplified by details to a larger scale, and where the subjects warrant further illustration, with half full-size sections of masonry and other mouldings. For the student who wishes to make himself better acquainted with the genius of this great architect, such drawings as those in this book will render his task relatively easy, and though nothing but a study of the actual work itself will furnish all that is to be learned from so eminent a master's design, it is equally certain, whether the work be Gothic or Classic, that good workmanlike measured drawings are of the utmost value to the architect. As Burgess admitted, they do not make the most attractive or popular-looking book, and it is far more easy to fill a folio with pictorial studies than to measure and plot on the spot a series of inaccessible facades and intricate plans. That goes without saying, though the facts is often overlooked, and, therefore, all the more praise is due to those who do take the trouble, and carry their work through to the end, as Messrs. Triggs and Tanner have done. They have illustrated, it would appear, all that they have found good reason to regard as Jones's work, and the authors say that the subjects thus chosen are arranged as far as possible in chronological order, commencing with 1617, when the Queen's House at Greenwich was designed, at which time the architect was 44 years of age. Prior to this date he was engaged on designs for masques for James I. On Jones's return from Denmark, where he had been employed probably as draughtsman under King Christian, who had given him architectural undertakings, in 1610, Inigo Jones

* Some Architectural Works of Inigo Jones. By H. Inigo Triggs and Henry Tanner, Jun. London: B. Batsford, High Holborn, W.C. Fol. 40 plates. 30s. net.

Grit for paving, per cwt.	1	8	d.
Use of caudon and utensils per day of ten hours	5	0	p
Caution men per day of ten hours	5	0	p
Spades ditto ditto	7	0	p
Taking up old asphalt	0	7	p
Materials only for 100 yds. per foot super.	0	7	p
Heating edge of old asphalt to form joint between laid and new work	0	1	p

TAR PAVING.

2 1/2 in. best tar-paving, laid with broken limestone, for London School Board	1	10	p
3 in. tarpaving, finished with a dressing of Dressing No. 3, rolled in	2	6	p

GRANITE PAVING.

Laid in screened gravel, including the gravel, forming and ramming the ground, but exclusive of digging or of concrete foundation.

New Aberdeen or Guernsey Granite Paving.

Paving, properly squared on the face and joints, and laid complete	per yard super.	8	6	p
Paving in parallel courses, not exceeding 5 in. in width on face, and laid complete	"	10	0	p
Ditto not exceeding 3 in. ditto ditto	"	14	0	p
Taking up paving and clearing the space	"	0	1	p
Add to last if stacked	"	1	3	p
Taking up paving and relaying	"	2	0	p
Screened gravel	"	2	6	p
Add if broken pavement and half sand are used in laying, grouting, and jointing	"	2	6	p
Cutting edges, play or circular, including waste	"	0	3	p

Add to foregoing paving, if in gutters or channels when separate or detached from similar paving, or in widths under 25 in.	per yard super.	0	6	p
Baking out joints of old pitch paving for grouting	"	0	6	p
Grouting old pitch paving with 1 of hydraulic lime to 2 of sand	"	0	4	p
Add to last if grouted with 1 of Portland cement to 2 of sand	"	0	3	p
3 in. by 10 in. Aberdeen granite curb, set complete	per foot run	1	6	p
3 in. by 10 in. ditto ditto	"	1	9	p
3 in. by 12 in. ditto ditto	"	1	9	p
3 in. by 12 in. ditto ditto	"	1	9	p
3 in. by 12 in. ditto ditto	"	1	9	p
3 in. by 12 in. ditto ditto	"	1	9	p
Taking up and resetting curb	"	0	3	p
Granite channels, 15 in. wide	"	1	3	p

Guernsey granite setts delivered alongside in barges at quays for London.

3 in. by 5 in. Chelsea	per ton	32	0	p
3 in. by 6 in.	"	30	0	p
3 in. by 7 in.	"	28	0	p
3 in. by 7 in.	"	23	0	p
3 in. by 9 in.	"	23	0	p
3 in. by 7 in.	"	23	0	p

To the price of setts and curbs add 6d. per ton for hauling, and the cartage according to distances, assuming a cartload at 1 1/2 tons.

FREESLE PAVING.

Paving and laid in screened gravel, including forming the ground	per yard super.	8	6	p
Paving with hard pebbles, averaging 3 in. in diameter, of uniform size, and bedded radwise in the gravel	"	9	0	p
Taking up ditto, and clearing the space	"	0	12	p
Ditto, and removing and stacking where directed, not exceeding 100 yds.	"	1	0	p
Screening and relaying ditto in gravel	"	1	0	p
Grouting to old or new pebble paving with 1 of Portland cement to 2 of sand	"	0	4	p
Add to last if grouted with 1 of Portland cement to 2 of sand	"	0	4	p
Paving pebbles, new	per ton	12	6	p

WOOD-BLOCK PAVING.

Wood-paving of 3 in. by 5 in. red deal blocks, grouted with cement, and laid on concrete	per yard super.	11	6	p
Ditto crenelated, jointed with bitumen, and laid on concrete	"	7	6	p
Baltic birch, cubed, and lying in sand, with grain uppermost, including trimming blocks, preparing ground, but exclusive of concrete foundation	"	10	0	p
Ditto ditto, and laid	"	10	0	p
Ditto ditto, lying only	"	0	8	p
Add if grouted with hot lime and sand	"	0	2	p
Add if joints are run in with hot lime and sand	"	0	6	p
time	"	0	6	p
Add with pitch or bitumen	"	0	6	p
Add if joints are tarred all round with mineral tar	"	0	2	p
Taking up and removing old wood paving (as in Portland cement concrete bed for foregoing)	"	0	24	p

ROAD-MAKING, ETC.

Ordinary macadamised road, laid with 3 in. by 5 in. red deal blocks	per yard super.	6	3	p
Cost of binding material for ditto	"	0	0	p
Steam rolling on roads	"	0	0	p
Spreading and levelling broken stone, brick, gravel, &c., from 1 in. to 3 in. thick, and well rolled	"	0	0	p

Ditto 3 in. to 5 in. thick, and ditto	per yard super.	0	0	p
Spreading and levelling material in 5 in. layers	"	0	0	p
Ditto and rolling	"	0	3	p
Spreading gravel, &c., the whole quantity to be made	"	0	6	p
Breaking old bricks into 3 in. cubes, hand labour only	"	1	3	p
Breaking up old flag or limestone ditto	"	1	3	p
Ditto, machine labour only	"	2	0	p
Breaking old granite, flint, or pebbles to 2 in. gauge, hand labour only	"	1	6	p
Ditto 1 1/2 in. gauge, ditto	"	3	0	p
Hand-breaking stone is more durable than machine breaking for roads	"	0	0	p
Granite slabs, 18 in. by 12 in. by 3 in. thick, gravel, &c., spread on surfaces to be calculated by aliquot parts of a measured cubic yard. Thus, a yard cube of broken stone or gravel is estimated to cover 12 yards super. 3 in. in thickness	"	14	0	p
Broken slag	per yard cube	14	0	p
Broken Kentish ruststone, delivered at Westminster, 1 1/2 in. gauge	"	8	9	p

3 in. deep.	5 in. deep.	7 in. deep.	9 in. deep.	11 in. deep.	13 in. deep.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
8 6	9 9	11 0	13 0	15 0	16 0
10 0	11 6	13 4	15 0	16 6	18 0
14 0	17 0	18 6	20 0	21 6	23 0
0 2	0 2	0 3	0 3	0 3	0 3
0 1	0 1	0 1	0 1	0 1	0 1
1 3	1 3	1 4	1 5	1 6	1 6
2 0	2 0	2 1	2 2	2 3	2 3
2 6	2 6	2 6	2 6	2 6	2 6
0 3	0 4	0 0	0 0	0 0	0 0

MATERIALS (SUPPLIED ONLY).

Cement, Portland	per bushel	1	10	p
Gravel, clean, unscreened, or local, per yard cube	"	4	3	p
" coarse screened, or clean fresh water ballast	"	5	3	p
" fine screened, good binding	"	8	0	p
" gravel for paths	"	5	0	p
Lime, unslaked, ground fine, unweathered	per bushel	0	10	p
Sand, pit or river, clean sharp, unweathered	per yard cube	6	0	p
" washed	"	8	0	p
" screening, labour only	"	0	6	p
Shingle, clean	per gadgee	3	6	p
Crestle, only, in barrels	"	0	3	p
Coal-tar pitch, in blocks	per ton	40	0	p
Stockholm tar, per barrel of 28 gallons	per barrel	2	0	p

Cost of Broken Stone.—The following table gives the cost of some of the better-known igneous rocks broken by machine, hand-broken stone being rather more expensive:—

COMPARATIVE PRICES OF BROKEN STONE BY MACHINE, PER TON (FREE ON RAIL).							
	3 in. to 2 1/2 in.	2 1/2 in. to 2 in.	2 in. to 1 1/2 in.	1 1/2 in. to 1 in.	1 in. to 3/4 in.	3/4 in. to 3/8 in.	3/8 in. to 1/4 in.
Mount Sorrel	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Stanton	1 9	3 9	4 3	4 3	4 3	4 3	4 3
Federy	1 9	3 9	4 3	4 3	4 3	4 3	4 3
Charwood Forest	1 9	3 9	4 3	4 3	4 3	4 3	4 3
Bardon Hill	5 3	5 3	5 3	5 3	5 3	5 3	5 3
Pennine	5 3	5 3	5 3	5 3	5 3	5 3	5 3
Cleithrum	5 3	5 3	5 3	5 3	5 3	5 3	5 3
Powley Rag	4 3	4 3	4 3	4 3	4 3	4 3	4 3
Guernsey	6 4	6 10	7 4	7 4	7 4	7 4	7 4

Wages, pavor's of per hour | 0 | 9 | p || labourer's | " | 0 | 6 | p |

Correction.—A correspondent has kindly drawn my attention to some prices which are not quite up to date. On page 5 of issue of 3th inst. the price of Portland stone at the quarry was given as being 1s. 4d. per foot cube, railway carriage to London as 1s. 8d. per ton, and cost per foot cube delivered at London termini as 1s. 10d. per foot cube.

The present prices are 1s. 5 1/2d. per foot cube for whitebed, and 1s. 7 1/2d. per foot cube for basebed (usual 20ft. average) at the quarry, delivered

to ship or rail. The railway rate from Portland to London is 7s. 10d. per ton, and the carriage by sea to above bridges, London, averages 5s. 6d. per ton all the year round. Thus the cost of stone delivered in trucks at the London termini is, for whitebed 2s. 0 1/2d. per foot cube, and for basebed 2s. 1 1/2d. per foot cube (usual 20ft. average).

Also, it was stated that "if the stone is worked at the quarry there is a saving in the weight for railway carriage, but the cost of that is nearly 40 per cent. more than for rough stone." By arrangement with the railway company only 10 per cent. extra is now charged for quarry worked stone over and above the cost of conveyance of stone in the rough.

I am much obliged for the corrections, and though prices are perpetually varying, the principles of estimating still hold good.

J. T. R.

(To be continued.)

LUXFER GLASS.

THE British Luxfer Prism Syndicate, Ltd., 16, Hill-street, Finsbury, have brought out an illustrated catalogue of their unique Luxfer art glass designs which ought to be of special interest to architects and decorators. Many advantages are secured by the use of plates by the process of cementing glass plates together, compared with other methods, such as those used in leaded glass, &c. We have referred to the advantage this process gives in so depositing the metal as to imbed the edges of the glass plates, the copper and glass becoming welded together. Other advantages are that the electro-glass dispenses with the use of saddle bars, so necessary for leaded lights, the plates of glass and copper so united are capable of resisting great wind pressure, less metal is used, and therefore the weight is reduced; and the plates not only combine great strength and rigidity, but are impervious to heat and cold, and wind and water tight. The electro-glass art glass designs are drawn to an inch to the foot scale; but any of the designs can be enlarged or reduced. The Syndicate can also execute any architect's design, and prepare designs for any prices per foot. The illustrations shown show every size and variety of plate for ornamental purposes to screens and vestibules and window openings. Some of these exhibit artistic design and freshness, as those numbered 231 &c., in which natural forms and conventional devices have been adopted. Nos. 334, 235, 237, 238, 241, 246, 249, 256, 275, 278 are examples for panels. The colours are subdued and harmonious, and well adapted as transparencies. Many of the oblong designs for single lights are admirable in design, and the aim of the Syndicate is not to obscure the light but to arrange the patterns in the quarries in the most effective manner, chiefly at the top and bottom of the plate. Several very elegant designs for fire-screens made of these plates are given, besides geometrical patterns. The prices of the art glass vary from 3s. 6d. to 10s. 4d. per foot super. With this catalogue the architect will be able to select any design for lights to suit his windows, or any panel for his screens, fanlights, and border. The designs can be reduced or enlarged, preserving the same ornamentation if necessary. For private residences, offices, banks, restaurants, and statistical buildings, the electro-glass plates are specially adapted, and we can congratulate the British Luxfer Prism Syndicate, Ltd., for having applied to artistic purposes the valuable properties of their copper-electro glazing. The Luxfer art-glass will in future take the place of leaded lights and other materials, which are so much required in purposes where strength as well as artistic design is required.

The death occurred at Brussels, on Monday, of M. Godefroid Guffens, a Flemish painter of repute, whose decorative work adorns various public buildings. M. Guffens, who was 88 years of age, had several foreign orders, and was a corresponding member of the Institut de France.

Mr. Bicknell, R.E., of the Local Government Board, had an inquiry at Chesham Hay last week respecting an application made by the Rural District Council for permission to borrow £5,000 for the purpose of carrying out a local water scheme for Chesham Hay. Mr. R. E. W. Berrington, C.E., of Wolverhampton, gave evidence, stating that boring operations had been carried out on land at Sarsden belonging to Mr. J. T. Hatton. The cost of the quantity of water had proved successful, and the analysis was satisfactory.

OBITUARY.

WE regret to record the death of Mr. HENRY YEOVILL THOMSON, F.R.I.B.A., late of Birmingham, which occurred on Tuesday at 9, Observatory-gardens, Campden Hill, Kensington. Mr. Henry Thomson was born in Edinburgh in 1826, and after being educated at a private school was articled to the late Mr. Charles Edge, architect, of Bennett's Hill, Birmingham, and within a short period after the completion of his articles he became manager of the architectural department in the borough surveyor's office in that city, under the late Mr. Pigott Smith. He, however, soon found greater scope for his talents in private work, and one of his first notable commissions was the designing of the Hebrew Synagogue, Singer's Hill. This most important work with connection with Francis-road Chapel, Edgbaston, and in this he showed a departure from a convention by adopting the Gothic style—a proceeding which, it has been said, was not to the liking of the older generation of Nonconformists of those days, though the example has since been copied since. Another building which added to Mr. Thomson's reputation as an architect was the Union Club premises in Colmore-row. The plans for St. Asaph's Church and the restoration of Harborne Church were other undertakings intrusted to him, and Mr. Thomson also designed the Birmingham Daily News office. His greatest work, however, was the Council House, which, though now rapidly becoming too small for the accommodation of the many departments of municipal work, will always be regarded as an ornament to the city. His plans were selected as the result of a competition. When the Art Gallery and Gas Offices came to be added Mr. Thomson again had the planning and supervision of the work, and it was carried out in a manner worthy of the original building. Among the more recent buildings which he designed may be mentioned the Jaffry Suburban Hospital. Mr. Thomson, who had been a Fellow of the Royal Institute of British Architects since 1862, devoted himself almost solely to his profession, and his retiring disposition caused him to take little part in the public work of the town.

His death is announced of Mr. PEARSON BELLAMY, architect, of Tentercroft-street, Lincoln, in his eightieth year. He was a native of Louth, was articled to the late Mr. Nicholson at Lincoln, and he subsequently served as an assistant in Manchester and Liverpool. Mr. Bellamy afterwards commenced partnership with Mr. Hardy, which had a long existence. The deceased gentleman was active in many town-halls, corn exchanges, and canneries. One of his chief buildings was the Ipswich Town Hall, a building in the Venetian style, built between 1863 and 1868. His principal emeries were those in Leicester and Loughborough, and he also planned the corn exchanges at Hull, Lincoln, Grimsby, and Bedford.

CHIPS.

Mr. Charles Samuel Morris, divisional surveyor for the West Riding of Yorkshire County Council, has been appointed county surveyor for Northamptonshire out of 167 applicants. The salary is £100 per annum.

In the course of the restoration work in the Palace of the Duke of Massa Carrara, at Carrara, there have been discovered two magnificent frescoes by Raphael. These frescoes fill two large spaces of the wall on which they have been discovered.

The fourth school built by the Hendon School Board in three years was, on Saturday afternoon, declared open by Sir W. Hart-Dyke, M.P. The new school has cost £18,884.

The Gladiolous memorial chancel at Buckley Church, Flintshire, erected from designs by Messrs. Douglas and Marshall, has just been dedicated by the Bishop of St. Asaph on Wednesday next.

The London County Council has decided to send its tramway manager, and also its electrical engineer, to America to find out the latest improvements and the best system of conveying electric traction. Tenders for the conversion of the lines between Tooting and the termini at Blackfriars, Waterloo, and Westminster bridges will be opened by the council at their first meeting after the summer recess.

Memorial-stones of a Baptist chapel were laid at Walsgrave-on-Sour on Saturday. The building will measure 42ft. by 28ft., and with end gallery will seat 294 adults, and will cost £1,500. Mr. John Worwood, of Coventry, is the builder.

Building Intelligence.

BIRMINGHAM. The dedication of the new nave of St. Michael and All Angels, Windmill-hill, took place on Friday. Seventeen years ago operations were commenced by the erection of a mission-room, which was subsequently enlarged, and later the chancel of a new church was erected on a commanding site. A year ago the important work was taken in hand of carrying out the whole of the scheme, which has now been shown in its original plan. This has involved an expenditure of over £5,000. The new building is of red brick with freestone dressings, and consists of a lofty nave with side aisles. Broseley tiles are used, and rising from a central part of the pitch of the roof is a ventilating shaft, while at the west end is a bell turret. A novel feature in the interior design is the introduction of massive square freestone piers to support the arcade dividing the nave and side aisles. The windows in the clerestory and elsewhere are of tinted glass; the floor is laid with stone blocks, and the roof is provided for 573 persons, making the accommodation of the church, with the chancel and side chapel, 625. Vestries for the choir and clergy are built on the north side, and the baptistery is in the south-west corner of the church in a small apsidal room. The architect for the work is Mr. John Bowman, of Stephen's Chambers.

BIRMINGHAM. The memorial-stones of the Wesleyan Central Hall were laid on Tuesday on a site nearly opposite the Assize Court. The hall is designed in the Free Renaissance style in which so much of Central Birmingham is being rebuilt. It covers an area of 2,766sq. yds., and has frontages to three streets—to Corporation-street, to the market place, to Ryder-street 113ft., and to Dulton-street 276ft. In the centre of the building is a tower, rising to a height of 180ft. On the ground floor are fifteen shops, with basement shops, together with salerooms, warehouses, and other offices for commercial purposes. The basement, capable of accommodating 500 children, will be retained by the mission as a ragged school. On the first and second floors are the large hall, synd-hall, and other rooms for Methodist purposes. The corridors which run round the hall give access to the side to twelve committee-rooms, and on the inside are frequent entrances to the great hall. The hall is 110ft. long, 90ft. wide, and 48ft. high, with seating accommodation for 2,300 persons 300 being on the orchestra, and 2,000 in the auditorium. The chancel is 50ft. wide, and is so arranged that the speakers have a low platform and an undivided audience. On the left-hand side of the tower is the church-house. The corridors leading from the stairs has on its left a committee room and the synd-hall, which will seat 500 persons; and on the right another large committee room and the Sunday-school. Along the corridor are the library and the ladies' parlours. On the floor above are twelve club and classrooms of various sizes for conducting the work of the mission. The chief material employed in the facade is red terracotta. The entire cost of the scheme is estimated at £100,000 to £150,000. The plans were prepared by Mr. Ewen Harper, and the contractors are Messrs. John Bowen and Son, all of Birmingham.

CHURCH BARRACKS AT WORKING.—On Tuesday afternoon Earl Roberts, Sir Redvers Buller, and the members of the headquarters staff drove from the War Office to the barracks at Working, where they made a minute inspection of the results of an experiment by the War Office in the conversion of barracks-rooms into cubicles. There are 100 cubicles in the barracks. They are the first to be erected for Army use. The dimensions of each cubicle are 11ft. 6in. by 7ft. 6in. Each cubicle is illuminated with one electric glow-lamp, and ample ventilation is provided.

DOVER.—On the 15th inst. the new pavilion on the promenade bank was opened. It consists of a concert-hall, 85ft. by 50ft., with seating accommodation for about 950 persons, and dressing-rooms, refreshment-bars, shop, and a pier-museum are provided in the building. The hall is

roofed in one span, with semi-circular steel trusses carried down to the pier girders, and there are no columns to obstruct the view of the platform, which is of ample size for an orchestra. The roof is of the scheme which includes the roving and strengthening of the under-structure of the pier, has been about £5,600. The work was executed in seven months, by Messrs. Anthony Faisey and Son, of Leytonstone, from plans and under the superintendence of Mr. M. Noel Biddle, A.M. Inst. C.E., and Mr. Robt. J. Beale, A.R.I.B.A., joint engineers, of Westminster, whose design was selected in competition.

NORTH SHIELDS.—The Borough of Tynemouth Conservative Club Company, Ltd., are building new club premises in Albion-road, North Shields, and the foundation-stone will be laid by Earl Percy, M.P., on Wednesday, the 18th inst. The building has a frontage of 40ft., and will be erected of red bricks, relieved with stone. On the basement will be a keeping cellar. The ground floor will contain smoke-room, reading-room, card-room, and luncheon-room. The stewards' kitchen and parlour are also on the ground floor. The first floor will consist of a billiard-room, the full front length of the building, which will hold four full-sized tables. On the same floor, running parallel with the billiard-room, will be a hall, off which runs a refreshment-room. A sliding partition, on being thrown back, will reveal a room capable of holding 400 people. The building will be lighted throughout by electricity, which will also be utilised for illuminating the billiard tables. Hot-water pipes will be used for heating the hall and principal rooms. The architect is Mr. F. R. N. Isaacson, F.R.I.B.A., North Shields, and the contractor Mr. W. T. Weir, Howdon-on-Tyne.

SOUTHWOLD.—The Grand Hotel built for the Coast Development Company was opened last week. The hotel, which faces the sea in close proximity to the entrance of the pier, consists of a main block nearly 150ft. in length, and of six stories in height, with an annex two stories high, extending F.R.I.B.A., North Shields, and the contractor Mr. W. T. Weir, Howdon-on-Tyne.

The ground-floor story and the lower ground floor are faced externally with red brick, with stone porches and dressings; the two stories above are coated with rough-cast of a warm cream colour, and the next story and the roofs above are covered with red tiles. The several stories are further diversified by turrets, bay windows, and verandahs. The main block, facing the sea, contains the principal public rooms, the lounge, dining-room, reading-room, and drawing-room, and the visitors' rooms. In the western annex is the principal entrance, the vestibule, office, and manager's room, smoking and billiard rooms, and also the kitchen and culinary offices, &c. The visitors' rooms, some of which have bay windows and verandahs, are mostly on the first, second, and third floors. Running right and left from the principal stairs and lift, on each of the upper floors, are corridors, in which are secondary staircases, the whole height of the building. The interior is lighted throughout by electric light. The lounge on the ground floor has three bay windows. The dining-room is about 50ft. by 34ft.; along the sea frontage are large bay windows, and the roof is of continuous arcade. The reading-room is a smaller apartment similarly arranged, with arched bays. The drawing-room, with its pannelled walls and ceiling, and its arched bays, is on the first floor. The system of heating the public rooms, the staircases, and the corridors, is by radiators. Though complete in itself, the building is arranged for future extension, by wings at the north and south ends. The architect is Mr. Charles H. M. Milham, of Lincoln's Inn-fields, London, assisted in the superintendence of its erection by Mr. G. G. Gould, of the Strand, and Messrs. Kerridge and Shaw, of Cambridge. The furnishing of the hotel is by Messrs. J. Shoolbred and Co., of London.

STAPLEHILL. The trustees of the Wesleyan Chapel have accepted the estimate of Messrs. Thos. Lowe and Sons at £2,240 for the erection of a new chapel and school buildings at Ferry-bridge, near Gouthwaite. The construction is immediate. The chapel, which is designed in the Early English style, provides accommodation for 400 adults, and consists of a central aisle and two transepts, with entrance vestibules. The north transept will accommodate the organ. The school will consist of a hall and a classroom, and will be provided with cloakrooms and lavatories. At the back of these buildings are provided vestry,

kitchen, heating-chamber, &c. The work will be executed in red brickwork and white stone dressings, the main feature of the chapel front being a large four-light tracery window. The whole of the roof timbers inside will be of pitch-pine, and will be exposed, being stained and varnished. The architect for the work is Mr. Thomas Jenkins, of High-street, Burton.

CHIPS.

The Cottage Hospital, Radcliffe, is being warmed and ventilated by means of Shorland's patent Manchester grates, with falcine chimney-pieces and special inlet pipes, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

At the last meeting of the Kings Norton Board of Guardians, Mr. B. Hall, C.E., was appointed consulting engineer at a fee of £100 per annum and 6 per cent. commission upon work executed under his supervision.

The Queen's Recreation Ground at Paignton was formally opened on Friday. It contains a pavilion with assembly-room and grand stand inclosure, the latter seated for 600 persons. The buildings were erected by Messrs. Webber and Sons, of Paignton.

The Lady Protheroe Smith Memorial pulpit, dedicated last week at St. Paul's Church, Truro, was designed by Mr. A. Fellows-Prynn, Plymouth, and executed in oak by Mr. R. T. Rogers, of Sidwell-street, Exeter.

Measures have been taken for the preservation of the unique remains of the Medieval city, harbour, and fortifications of Famagusta, Cyprus.

A select committee of the House of Commons, after having been engaged in its consideration for eight days, has thrown out the Shields-bridge Bill. A private syndicate sought powers by the bill to construct a transporter bridge across the River Tyne connecting North and South Shields. Bridges of this description, invented by Mr. Arnodin, a French engineer, are already in use on the Continent, and powers have been granted for their construction across the Mersey, the Ship Canal and the Usk at Newport, but so far none are yet in operation in the United Kingdom.

An open space in the centre of Middlesbrough, which has been converted by the corporation of the town into a public garden and recreation ground, and named Victoria-square, in commemoration of the Diamond Jubilee of Queen Victoria, was formally opened on Friday afternoon. The ground has been cut, planted, and beautified at a cost of £2,380. It covers 13 acres, and has diagonal paths, a wide, and a circular space 80 ft. diameter around a bandstand.

The town council of Wolverhampton have elected as borough surveyor in succession to Mr. Bradley, resigned, Mr. George Green, at present surveyor for the district of St. Martin-in-the-Fields, Westminster. They have also decided to carry out various alterations and additions to the town hall at an estimated cost of £14,944. The building originally cost £22,000.

At a sale of timber on the Welbeck Estate of the Duke of Portland, on Saturday, a grand oak fetched the large sum of £100.

The purchase of Leighton House, to serve as a public memorial of Lord Leighton, and also as an art museum for Kensington, was advocated on Friday at a meeting held in Kensington Town-hall. The Bishop of London, Sir William Richmond, Lord Percy, and Sir Martin Conway were amongst those who spoke in favour of the proposal, and it was agreed to approve the Kensington Borough Council in the matter.

The Plumbers' Registration Bill was introduced into the House of Lords on Friday night, and was read for the first time.

At the London Consistory-court, on Friday, the Chancellor of the Diocese granted a faculty to authorise the erection of a mission-hall seating 325 persons adjoining the Trinity Church, West Hampstead, and the placing of a stained-glass window in memory of the memory of the Rev. Henry Sharpe, the late incumbent.

On Wednesday last Mr. Bicknell, Local Government Board Inspector, held an inquiry at Shifnal into the application of the rural district council for sanction to borrow an additional £2,500 for works of sewerage and sewage disposal in the Shifnal special drainage district. The work originally was estimated to cost £6,017, and this sum had been expended. Since then, however, an additional £2,983 had been borrowed, and this still proving insufficient, the present application for an additional £2,500 was made.

The Camberwell Borough Council are inviting architects to submit designs for public baths and washes to be erected in the Old Kent-road in accordance with the terms of the conditions. A loan of £50,000 is to be obtained for these buildings.

COMPETITIONS.

FALMOUTH.—The General Purposes Committee reported to the town council, at their meeting on Thursday last week, that they had received favourably reports from Mr. Le Maître and Messrs. Pollard and Tingle with reference to the drainage, and recommended that the scheme marked "Gravitation No. 2" be submitted to the Local Government Board for their approval, and that application be made for permission to carry out the project. The Mayor, in proposing the adoption of the report, said the corporation had assured the Local Government Board that they were preparing a comprehensive scheme. On the advice of Mr. Brereton, C.E., their adviser, they had selected three of the best schemes.

No. 2 was the cheapest of these three proposals, and was estimated to cost £16,390, in addition to the engineer's commission of £872. A long discussion ensued, several members objecting to the drainage scheme as unnecessary or unduly costly, and a division showed the members to be equally divided, the Mayor giving his casting vote in favour of the adoption of the report.

PLAYING CARD MAKERS' COMPANY.—The Court of Assistants of the Worshipful Company of Makers of Playing Cards have awarded the prizes in the recent competition for the best design for the backs of playing cards in connection with this Company: 323 designs were sent in for the competition, and the prizes were awarded as follows:

The "H. D. Phillips" prize of £100 to Mr. George D. Drummond, Clifton-road, South Norwood; second prize of £5 5s. to Mr. H. W. Hardy, Featherstone-buildings, Holborn; third prize of £3 3s. to Mr. E. P. Proctor, Broadwater-gate, London; and fourth prize to Mr. E. E. Middleton, Ellington-road, Aston, Birmingham. The designs of five competitors were highly commended.

TROWBRIDGE.—For the proposed isolation hospital, for which premiums of £20 and £10 were offered, the town council have received 51 sets of designs. These will be submitted to the judgment of an assessor.

Mr. Andrew Carnegie has written to Councilor Ormer of Coalbridge offering £15,000 for a Free Library, on condition that the Burgh provides a suitable site.

The business of Tokenhouse-yard Mart during last week was fairly satisfactory, several properties were sold, and the week was commenced four years ago. The original contract was £4,100. Owing to a dispute between the contractor and the engineer the work was left standing, with disastrous results. The work is for a sewerage and drainage work, as the Local Government Board intimated they would only sanction a complete scheme.

An inquiry has been held at Wimbledon by Major C. E. Norton into the application of the urban district council for sanction to borrow £6,000 for works of sewerage, £7,400 for purposes of electric light, and £3,637 for works of private street improvement.

The foundation-stone of a new Wesleyan chapel was laid at King's Norton on Monday. Designed by Mr. J. H. P. Taylor, the Tudor style, with a handsome tower and spire, the chapel is to be built of red brick, with York stone dressings, and will consist of a nave and aisles divided by enriched granite columns. The total provision is to be made for 180 kneelings, and the plans permit of further accommodation being secured when necessary by the addition of transepts and a chancel. The main entrance is to be large, the Middlesex Road, the builders are Messrs. Harley and Son, of Smethwick.

At Bulth, a Welsh Presbyterian Church is about to be erected on the site now occupied by the Alpha Chapel, from plans by Messrs. Habershon, Fawcaker, and Greaves, of Newport, Mon.

Application has been made to the Local Government Board by the corporation of the Victoria Hall and new buildings to be erected adjoining.

PROFESSIONAL AND TRADE SOCIETIES.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—The fifty-eighth annual congress of the British Archaeological Association, which opened in Newcastle yesterday (Thursday). The patron of the Association is His Grace, the Duke of Northumberland, K.G., and the president, Mr. Thomas Hodgkin, D.C.L., F.R.S. Yesterday the members of the Congress met in the Council Chamber of the town-hall at eleven o'clock, when they were received and welcomed by the mayor and members of the corporation. Afterwards the antiquities of the city were inspected. The president's address was delivered at the evening meeting and conversation at the College of Science. To-day (Friday) the members will journey to Warkworth and Alnwick. To-morrow a visit will be made to the old church at Jarrow, Monkwearmouth Church, and Tynemouth Priory. On Monday the members will proceed to Chollerford, from whence carriages will convey them to the Cheaters. Tuesday will be devoted to a visit to Holy Island. Wednesday to Durham, Thursday to Flodden, and Friday to Hexham and Corbridge; and evening meetings will be held to-day, to-morrow, and on Wednesday next.

KENT ARCHAEOLOGICAL SOCIETY.—The annual meeting of this society will be held at Maidstone the week after next. On the first day (Tuesday, July 30) the annual business will be transacted at 11 a.m. at the Old Palace, which the members will afterwards inspect under the guidance of Mr. Hubert Bensted, F.R.I.B.A. The parish church of All Saints will next be visited, and the members will proceed to the rooms of the adjacent college gateway. At 1.30 carriages will be sent to convey the company to Leeds Castle, where the Society will be received by Mr. C. P. Wykeham Martin and Mrs. Wykeham Martin, by whom the visitors will be conducted over the building. A brief account of the history of the castle will be given by Mr. F. W. H. Miles, F.R.S., Curator of Maidstone Museum. Progress will next be made to Leeds Church, an inspection of which will be made under the guidance of the Rev. A. P. Morris (vicar) and Mr. George Payne, F.S.A., hon. secretary. At 6 p.m. the annual dinner will take place under the presidency of Earl Stanhope at the town-hall, Maidstone. At the evening meeting, to be held in the Museum, papers will be read by Messrs. F. V. James and Hubert Bensted, the former on "The Museum and the Collections Contained Therein," and the latter on "Houses of the Middle Ages." The collections of antiquities in the society's rooms at the Museum will be described by Mr. George Payne.

A committee of the House of Lords passed, on Tuesday, the preamble of the West Cumberland Electric Tramways Bill, which has already passed the Commons, and which authorises the construction by the West Cumberland Electric Tramways Company of 31 miles of tramways, at an estimated cost of £361,579. The tramways will run from Cleator Moor through Whitehaven, Workington, and Maryport to Silloth, and will serve a population of 129,000.

A stained-glass memorial has just been put in one of the lower windows of the north transept of the Abbey at Ramsey, Hants, to the memory of Professor Rumsey, whose family had connection with the town in the reign of the Holy Roman Emperor is the Annunciation, from the design of Mr. Hargreaves, who designed the large east window to the memory of Lord Mount Temple. The tympanum has been fitted with two heraldic shields, thus being done in mosaic. The whole has been executed by Messrs. Powell, of Whitefriars, London.

The new technical school at Manchester in course of erection at a cost of over £300,000 is approaching completion. It is five stories in height, and has been planned by Mr. W. G. Barfield, of Rochdale.

All Saints' Convent, belonging to a sisterhood of the Church of England, has just been built at Colney Park, near St. Alban's, at a cost of £40,000. The site comprises an area of between seventy and eighty acres, the convent building, which has been constructed almost in the centre, occupy about two acres and a half. The convent stands on the same site as the large mansion which formerly existed, and it will be approached by a carriage drive from the main road, whilst the lodges at the entrance gates are also retained. Mr. Leonard Stokes is the architect, Messrs. King and Son, of Vauxhall Bridge-road, W.C., the builders. Mr. John Childs being the general foreman of works. The building is of red and buff-coloured brick with white stone dressings.

that the expense of the models would not exceed £600. The Earl of Pembroke said Lord Wensley would release that in two years the Government felt it out of their power to accede to a similar motion, it was much more difficult now to make any attention in the buildings, as in the course of the last year the Earl of Wensley's letter had been done. The Earl of Wensley said all that had been done was to clear and excavate the ground and to spread over the basis a concrete. Not a single brick had been laid. Lord Pembroke said the Government had no other proposal before them, and the plans and elevation adopted had been generally approved. The reference to the Archbishop's letter, that the buildings were only incidental, the object of his letter being to urge the importance of the appointment of two architects for such public buildings, was not to be interpreted by that. The noble lord had warned them that unless they took great care there might be a repetition of the new Admiralty buildings. He confessed he shared the noble lord's dislike to the exterior facade of the new Admiralty buildings, but the Government, in considering the new buildings for the War Office, were particularly careful to avoid the system under which the Admiralty buildings were built. Those buildings were the result of a Select Committee of the House of Commons, and that result had proved conclusively that a Select Committee of the House of Commons was probably one of the worst kinds of matters of this sort. His noble friend was an admirer of Inigo Jones, and he shared that admiration; but it must be recognised that the work of Inigo Jones had to be done in a modern, reasonable way, and the requirements a modern architect must be engaged. The eminent architects, now unfortunately taken from us, who drew up the plans for the contemplated buildings, were not asked to make a request for a public office, and then prepared a facade worthy of such a structure. The plans and elevations would be faithfully followed, and those who were responsible for the building did not ask for models. The plans had received general approval, and he saw no reason for going to the expense of £600 for a model. Lord Tweedmouth thought the expenditure of £600 would be but a drop in the ocean of the entire cost, and certainly the cost of a better way of satisfying public opinion. Lord Stanmore also supported the motion, as he held that before great public buildings were erected models should be made. The Marquess of Blandford doubted whether a model always gave a perfectly clear impression of the effect which a building when erected would produce. Unless it were a model on a scale of 1/20, it would not be fair to altogether do so; also, unless the model included the whole neighbourhood, it would give an inadequate impression of the appearance of the buildings when completed. Nothing could be more unfortunate than that the long delay that had already taken place should be added to by reopening once more the whole question of the designs of those buildings. The designs were adopted upon the recommendation of the Institute of British Architects after three leading members of the profession had been employed. He believed these plans met with general approval. If the matter were reopened, they had no security that the buildings would be completed in the near future. On a division, the motion was carried by 41 votes to 20.

The channel of All Saints' Church, Marton, Devon, after being decomated, was opened last week by the Ven. Archdeacon Seymour. The artist was Mr. W. H. Ward, of London, and the work was executed by Messrs. Squire and Son, Bideford.

The Melbourne contractors, Messrs. Smythe and Roberts, of Melbourne, Australia, whose tenders for the reclamation work at Yarrow, Victoria, had at £27,500 have been accepted, have a staff of 400 hands employed, drawing £1,000 in wages weekly. The War Office Department has adopted the plans and specifications.

Five blocks of labourers' dwellings have just been erected for the Bristol Corporation in the St. Philip's Marsh and Baptist Mills districts at a cost of £22,000. The blocks are divided into separate tenements, each being self-contained and furnished with kitchen range, larder, boiler, and separate sanitary conveniences—in fact, each is practically a house in itself. There are altogether 70 tenements, of which 35 contain a sitting-room and one bedroom, and 44 a sitting-room and two bedrooms. The dwellings are expected to yield a rental of 8 per cent. upon the capital invested if they are let at 4s. 6d. per week for two-room tenements and 3s. 3d. for the two-room houses.

The parish church of St. Leonard's-on-Sea has placed in its east wall a new stained-glass window, representing the subject of the Epiphany. The windows of St. Leonard's, St. Leonard-on-Sea. The stained glass is of ruby colouring, the arms of the Cinque Ports are in the top of the window and those of the donor at the foot.

LEGAL INTELLIGENCE.

AN ARCHITECT'S ACTION AGAINST DIRECTORS.—**CACKETT V. KENNEDY.**—This action, heard by Mr. Justice Parry on Thursday and Friday last, was brought by Mr. J. T. Cackett, an architect, of Newcastle-on-Tyne, and a shareholder in the amount of £500 in the Pannico Copper Company, against Mr. William Kennedy, M.P., and Lord Justice Stirling, Mr. R. Cunningham Glen moved on behalf of Mr. Ellis for a rule nisi for an order calling on Mr. D'Emcourt, the Metropolitan Police magistrate, to show cause why he should not make a case for the opinion of the King's Bench Division. The magistrate refused to state a case, being of opinion that the point of law raised was frivolous, and the Divisional Court refused a rule nisi to compel him to do so on the same ground. The question was whether a building which had been erected by Mr. Ellis was merely an extension of an old building, in which case it would not contravene the provisions of the London Building Acts, or whether it extended beyond the general line of buildings in the street, or whether it was the erection of a building so as to contravene the provisions of the Act as to the general line of buildings. The magistrate held that it was the latter, and ordered the building to be pulled down. Counsel contended that the magistrate was bound to hold that the extension was not an extension, and that the point of law was not frivolous. The magistrate could only refuse to state a case on a point of law if the point was frivolous. The Master of the Rolls, Lord Justice Stirling, and Lord Justice Ellis because it involved the pulling down of a building which had been erected. For this reason we think that a rule nisi should be granted calling upon the magistrate to show cause why he should not make a case for the opinion of the King's Bench. When the rule comes on for argument it will be open to the other side to show that the points are frivolous.

IS AN ARCHITECT AN AGENT OF OWNER OR CONTRACTOR?—At the Newcastle-on-Tyne Assizes, before Mr. Justice Bruce, the action of Emley and Sons, Ltd., v. Hardy and others for goods sold and work done was tried on the 11th inst. The action charged that the defendants, who were the suppliers to the defendants by the plaintiffs, Plaintiffs carried on business in Newcastle as furnishing ironmongers, and the defendants were at the time engaged in the erection of buildings in West Hartlepool, for which one of the defendants (Mr. Blackwell) acted as architect. The case involved some rather complex questions of agency, because the orders given were given in the majority of cases to Blackwell, the architect, and the question that would come before the court would be, for whom was architect acting as agent in giving the orders? The plaintiff claimed that it was on the part of the defendants, the owners of the buildings, and the defendant claimed that it was on behalf of the contractors. For the defence it was urged that the main question was whether the architect ordered the goods in the name of the defendants, and whether he was to order the goods in their name, he was authorised to do so. Evidence was then given in support of the plaintiff's claim. His Lordship ruled that there was no agency on the part of the defendants. Mr. John Hardy denied that he ever authorised Blackwell to order goods or work, so as to render witness liable to Messrs. Emley. Mr. Fryer, a solicitor, at Hartlepool, swore that the necessary goods were ordered by Blackwell to pledge his credit to Messrs. Emley. Counsel for the defendants argued that the plaintiffs were suing Messrs. Hardy and Fryer, who had paid the contractors. His Lordship said that the plaintiffs had entirely failed. He gave judgment for the defendants with costs.

THE VALUE OF LAND AT YARMOUTH.—In the case of "Trustees of Children's Hospital Charity v. Midland and Great Northern Railway Companies," the House of Lords, consisting of Lord Macmillan, Lord Minister, sat as arbitrator last month on a claim for £10,000 made by the trustees against the joint committee of the two railway companies in respect of 12 acres of land which had originally been acquired by the committee's railway to Lowestoft. Mr. W. H. Ellwell, of Howard House, Arundel-street, Strand, sat as arbitrator on behalf of the

joint committee; and Mr. Francis Horner, of Norwich, for the trustees. The experts called for the trustees gave estimates of value of £3,075, £7,399, and £8,000; while for the joint committee the estimates were £2,716, £2,466, and £2,716. Mr. Ryde has now published his award, which amounts to £3,500.

LABEL ACTION BY A DEPUTY BOROUGH SURVEYOR.—In the Nisi Prius Court at the Hants Summer Assizes, held at Winchester last week, before Mr. Justice Kennedy and a special jury, a libel action was heard between Inigo Jones and architect, and Holmes and Sons. At the time the action was of the alleged libel the plaintiff was deputy-surveyor, deputy-manager of the waterworks, deputy-inspector under the Petroleum Acts, and deputy-inspector of nuisances of the Borough of Andover. The defendants were the proprietors of the *Andover Advertiser*, and on Feb. 1 this year they published in their newspaper an alleged libel on the plaintiff, attacking him respecting his office deputy-surveyor, especially with regard to the condition of the roads. For the plaintiff, several members of the town council of Andover, and Mr. W. J. Taylor, surveyor to the Hants County Council, were called to speak as to the excellent condition of the highways. For the defendants, Mr. W. Burroughs Hill, architect and surveyor, Southampton, and Mr. H. H. Jones, architect and surveyor, and also of Southampton, Mr. F. Ellen, auctioneer and estate agent, of the same town, deposed that the roads were unsatisfactory in character. The jury returned a verdict for plaintiff, damages £100.

ISOLATION OF THE NATIONAL GALLERY.—At the Surveyors' Institution, on Wednesday, Mr. H. A. Hunt sat as sole arbitrator to assess the amount of compensation to be paid by H.M. Office of Works to Mr. E. J. Watkinson, a dealer in artistic jewellery, for the compulsory acquisition of his premises in Pall Mall East. For the claimant, Mr. Cripps, K.C., stated that Mr. Watkinson's premises had been acquired for demolition with the view to the protection of the National Gallery. The client had carried on business at the shop in question for 37 years, and 24 years of the lease had still to run. As regarded the property, the claim amounted to between £100,000 and £150,000, which 10 per cent. had to be added for compulsory purchase. The net profits of the business for the past five years had averaged £4,000 a year. The respondents had agreed to pay £75,000 for the property and the stock and to value at £22,000. Expert evidence was then called as to the value of the property and the probable loss that would accrue by the removal of the business. Mr. Watkinson, on the other hand, deposed that his premises were practically burglar-proof and contained many strong rooms. The proceedings were adjourned until July 26.

CHIPS.

A service of commemoration and thanksgiving for the rehanging of bells in the east Bergholt parish church, Suffolk, was held on Thursday last week. Considerable interest was shown, both before and after service, in the ringing of the bells, which is done, not by ropes, but by a cage in the churchyard. The bells have been rehanged at a cost of £82.

Mr. Harold R. Dixon, on behalf of his father, Sir Raydon Dixon, placed in position, on Tuesday, the top stone of the recently-erected tower and spire attached to St. Andrew's Church, Mallow, Herefordshire. The cost of the addition has been £500.

The Mayor of Croydon formerly opened, on Wednesday, Gmge Wood Park, recently acquired by the corporation as a public recreation-ground. The park is 29 acres in extent, and has cost £100 to purchase, the total cost of the ground being £23,730.

The New York Board of Estimates adopted on Wednesday a resolution accepting Mr. Andrew Carnegie's gift of 5,200,000d. for the endowment of sixty-five public libraries.

The St. Pancras Borough Council agreed to contribute £28,125 to the cost of the new extended toll-tribute one-eighth (£28,125) to the London County Council is prepared to expend in widening the southern end of Hampstead-road at its junction with Euston-road.

The Bishop of St. David's performed on Friday the ceremony of dedicing a new window which has been placed in St. Mary's parish church, Swansea, at a cost of £500, in memory of Mrs. Smith, the wife of the vicar, Chancellor J. Allan Smith, D.D. The design for the window was from the Old Testament, and under each figure is a scene illustrating some incident in his life.

On Monday, his ninety-first birthday, the Rev. John Spurgeon, father of the eminent Baptist preacher, who have predeceased him, laid the foundation-stone of an extension of the South Norwood Baptist Church.

Our Office Table.

FOLLOWING on Mr. Walter Crane's vigorous protest in the *Manchester Guardian* against the introduction of examples of "L'Art nouveau" into South Kensington Museum Messrs. John Belcher, A.R.A., Reginald Blomfield, Mervyn Macartney, and E. S. Prior have signed a letter to the *Times*, in which they remark:—"This work is neither right in principle nor does it serve a proper regard for the material employed. As cabinet-makers it is badly executed. It represents only a trick of design which, developed from debased forms, has prejudicially affected the designs of furniture and buildings in neighbouring countries. In its present position it is in danger of being looked upon as a recognised model which has received the approval of the authorities for study by students and designers, and the harm it may thus produce on our national art cannot be easily gauged." The memorialists strongly protest against its recommendation by the authorities to the notice of furniture-makers and others.

It has been decided to hold an art and industrial exhibition at Wolverhampton next year, on similar lines to that now on view at Glasgow. The executive committee have appointed Mr. H. A. Hedley, the manager of the Glasgow Exhibition, to act in a like capacity. The guarantee fund now amounts to £36,000, and it is to be further raised. Lord Carmarthen has granted the free use of a large area of ground as a site, and the town council has also set aside a portion of the West Park containing a large lake and several roads to be utilised as exhibition space. The whole will cover between 30 and 40 acres. Plans for the laying out of the site and the erection of a number of buildings have been prepared by Messrs. Walker and Ramsey, of Glasgow, and have been approved. These provide for the erection of an industrial hall, 375ft. by 170ft., a large machinery-hall, concert hall, restaurants, &c. It has been determined to make the exhibition of an international character, and promises of support and to contribute exhibits have already been received from Canada, Russia, and other foreign countries. Contracts for the work in connection with the buildings will be given to the contractors while the corporation electric tramways which are in course of construction to pass the exhibition ground and through a large portion of the town in connecting outside places will be completed before next May, ready for the opening ceremony of the exhibition.

The Bishop of Bristol writes appealing for help towards making safe the Abbey Church of Malmesbury. "No place," the Bishop writes, "can claim more unbroken ecclesiastical and educational continuity between the Irish, British, and English churches than Malmesbury. Aldhelm was trained here, and became the greatest scholar among the English people of the time immediately preceding Bede. William of Malmesbury, the greatest of the early Medieval historians, added a new fame to the place of his abode. Aldhelm's Saxon basilica of stone was standing at the time of the Danish conquest, and, like his other great church at Sherborne, it was spared by the Norman architects. It was not till after William of Malmesbury's time that the monks built the present Norman nave, about 1140-60. Six of the bays of their nave remain, and form the present parish church. The three western bays and the west front are in a ruined state; but so much of them remain that no great cost is needed to make them quite safe, while retaining, and indeed in some respects enhancing, their picturesque appearance. The noble northern arch of the central tower needs careful attention. When I became Bishop of Bristol in 1891, the parish church caused me very great anxiety. The flying buttresses and parapets were actively dangerous, and there were grave fears lest a double buttress at the southwest point should give way, in which case the singularly noble south porch would have been destroyed. By great exertions the people in and near Malmesbury have raised between £3,000 and £4,000, and this has enabled us to make safe almost the whole of the six bays used as the church. But much is needed beyond barely making safe; and the more ruined parts of the old building cry aloud for attention." The sum it is desired to raise for the continuance of Mr. Brakespear's work of restoration is £10,000.

Is interesting an appeal for funds for the further

restoration of St. David's Cathedral, Mr. J. Oldrid Scott, F.S.A., describes the works already accomplished there through Dean Howell's efforts. "The beautiful Lady-chapel, which has for so many years been roofless and all but ruinous, has now," says Mr. Scott, "been brought back to the condition it was in before Bishop Vaughan's grained ceiling was destroyed. The vaulting has been replaced, and a good roof raised. The parapets and pinnacles have been restored, the flying-bazons and a suitable avoirdupois laid. Bishop Martyn's fine monument on the south side has been rescued from ruin, and the chapel sufficiently furnished so that it can once more be used as a part of the cathedral. The ante-chapel has at the same time been paved and repaired. Unfortunately, the north and south aisles, forming the connecting-link with the cathedral, are still exposed to the weather, and must remain so till sufficient funds can be found to enable us to replace their roofs and stone girding."

CONTRARY to general expectations, France has not purchased the great collection of Gaulish and Merovingian antiquities which belonged to M. de Bouteiller, and which has been bought by the authorities of the British Museum. The collection includes relics of pre-Roman Gaul, of the Roman period, and of the Merovingian days, and thus extends from the Stone Age far into the Christian era. The trustees of the British Museum are about to exhibit the collection separately to the public before it becomes located in the general collection, which is not stored in the department of antiquities in the Museum.

At the Royal Scottish Academy Galleries, Edinburgh, a loan exhibition of pictures by Sir Henry Raeburn and other deceased Scottish artists was opened on Monday. It has been produced by the Scottish Board of Manufactures, and it has for a special feature an exhibition of about 40 portraits by Sir Henry Raeburn, which, along with some 144 pictures and portraits by deceased Scottish artists, have been lent for this occasion by their owners. In the general catalogue of the artists, Sir James Watson Gordon (eight works), the Rev. John Thomson of Duddingston, Sir David Wilkie, Andrew Geddes, Sir William Pettes Douglas (fifteen examples), Sir George Harvey (nine pictures), G. Paul Chalmers, John Pettie, and Alexander Fraser are well represented; and it has been also been taken together an excellent collection of portraits of Scottish artists—so that in many cases the visitor can see the pictures and the men who painted them. Unfortunately the exhibition does not include a portrait of the "Scottish Reynolds" himself.

THE ninth Memoir in the series published by the Archaeological Survey of Egypt, the *Mastaba of Ptahhotep and Akhetepet*, at Saqqarah, by Mr. N. de G. Davies, throws an interesting light on Egyptian life during the Fifth Dynasty—i.e., about five thousand five hundred years ago. The view then entertained of the Future State corresponded very nearly with that depicted in the *Odyssæe* and the *Æneid*—viz., that the occupations of this life were pursued in the shadow-land beyond the grave. The tomb chambers of this Mastaba are very elaborate, and their walls are covered with sculptures. These represent almost every kind of life on an estate in ancient Egypt. The artist shows us the fields at harvest time, and the workmen gathering the crops, the labourers cutting logs, tending or slaughtering the cattle, the boatmen struggling in the marshes, the reapers, herdsmen, and fishermen, the keepers of accounts, and overseers—all are to be seen in shadowy company of the dead master whom they had obeyed during his life.

THE American Iron and Steel Association reports that the production of iron and steel wire rods in the United States in 1900 amounted to 816,291 gross tons, against 1,636,398 tons in 1899, and 1,071,683 tons in 1898, showing a decrease of 100.107 per cent. or over 18 per cent. in 1900 as compared with the previous year. Of the total production in 1900, 1,929 tons were iron and 844,362 tons steel rods. Pennsylvania made the largest quantity of wire rods in 1900, Illinois coming second, Ohio third, and Massachusetts fourth. The States of New York, New Jersey, New York, New Jersey, Kentucky, Alabama, and Indiana. The production of steel wire rods in the United States in the year under notice amounted to 7,233,377 kegs of 100 lbs. as compared with 18,130 kegs in 1899, or 55 per cent. decrease of 384,131 kegs, or over 5 per cent.

1898 the production amounted to 7,418,475 kegs, in 1897 to 8,997,215 kegs, in 1896 to 4,719,890 kegs, and in 1895 to 5,841,403 kegs. The wire rods produced in 1900 were manufactured by 56 works, being three fewer than in the previous year.

CHIPS.

Mr. Carnegie has offered to give £3,000 for a free library for Annan, Dumfriesshire, on condition that the site be provided and the sum for its maintenance guaranteed.

At the London Consistory-court on Friday, Dr. Trautman, K.C., granted a faculty to authorize the rebuilding and enlargement of the organ in the north chapel of the parish church of St. Mary, Harrow-on-the-Hill, and the consequent removal and replacing in such positions as might be selected of certain monuments and ornamental buildings.

Mr. George Bell, quantity and building surveyor, 13, Westgate-road, Newcastle-upon-Tyne, has opened new offices in Church-street, West Hartlepool, for the convenience of his clients.

At Bow-street Police-court, on Friday, Mr. Owen Edwards, of the solicitors, in the London County Council, applied to Sir F. Lushington to appoint a surveyor to value various premises situated between New Church-court, Strand, and the Law Courts. The buildings in question are to be pulled down in consequence of the Strand-to-Holborn improvement scheme, and the Council has been unable to agree with the parties interested as the amount of purchase-money. The magistrate agreed to appoint Mr. George Edwards, of Bedford-row, and Mr. Edwards remarked that the Council would obtain possession by paying the money into Court in accordance with his valuation.

The contract for building the new post-office at Barnstaple has been awarded to Messrs. Vowday and Son. The work will shortly be commenced.

Colonel A. G. Durnford, R.E., of the Local Government Board, attended on Friday at the council offices, Walkden, to inquire into the local district council's application for sanction to borrow the sum of £10,000 for the purpose of carrying out the scheme of the town of Walkden, in the township of Barnstaple and in other parts of the township.

A large clock has just been erected in the church tower of St. Andrew's, Stockwell, London, which shows time on four large dials, strikes the hours, and is fitted with all the modern improvements. The clock was made generally to the designs of Lord Grimthorpe by John Smith and Sons, Midland Clock Works, Derby.

At Wood Green, on Friday, the Earl of Jersey and other Light Railway Commissioners concluded an inquiry into an application by the Middlesex County Council for sanction to a scheme for the construction of five lines of light railways in the county. These included lines in Hornsey, Tottenham, Friern Barnet, and Wood Green, and a total of 73 miles. The proposed lines from Archway-road, Highgate, along Muswell Hill-road to Muswell Hill and the Alexandra Palace, was strongly opposed, as was also the proposed line along Tottenham-bus-line, Hornsey. Lord Jersey said that the Commissioners could not recommend the sanctioning of the Muswell Hill line, but they would recommend the sanctioning of the Tottenham-line, subject to the railway being widened to 50ft. or, with the approval of the Board of Trade, to a minimum of 45ft. where 50ft. could not be obtained. They would also recommend that the construction of the other lines be left to the Board of Trade.

With the proceeds of a legacy of £2,500 from the late Mr. Weston, a tower has been added to St. Paul's Church, Hulton near Bolton.

Lord Iveagh is following up his former generous gifts to Dublin by restoring the buttresses of St. Patrick's Cathedral.

A new railway station at Weybourne, midway between Sandown and Holt, on the Midland and Great Northern joint system, in Norfolk, was opened for traffic last week. It is about 14 miles from the sea-coast, and is also the nearest station to Claydon.

The Local Government Board have been asked by the Local Sanitary Authorities of the County of Public Advertising, and by a large number of distinguished persons, including Mr. Alfred Waterhouse, R.A., and Mr. F. G. Jackson, R.A., to consider whether any legislation should not be introduced which would give municipal authorities the power to control advertisements. The Board have replied that the Government will watch with interest any such Bill introduced by a private Member.

The inauguration of the new Consumptive Hospital, in connection with the Hulse House for Incurables and the Treatment of Chronic Disease, Kinross Hill, Perth, and a gift to the society from Sir Robert and Lady Pullar, took place on Monday last. The hospital, which cost £15,000, and accommodates ten men and ten women.

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Our Illustrations.

PUBLIC LIBRARY (PASSMORE EDWARDS), SAINT GEORGE'S PUBLIC BATHS AND WASHHOUSES, CAMBERWELL.

NEXT Thursday the Lord Mayor of London and Sheriffs will attend the South London Art Galleries at a reception to be held by the Mayor of the Borough of Camberwell, Mr. Matthew Wallace, J.P., after the function of laying the foundation-stones of this block of public buildings to be erected on a fine site in Wells-street, S.E., close by St. George's Church, near the canal. The land was given for the purpose by Lord Langatock. The foundation-stone of the library will be laid by the donor of that building, Mr. J. Passmore Edwards, who also gave the public libraries at Dulwich and Nunhead, as well as the Lord Leighton Memorial Institute and rear Art Gallery in the Peckham-road, all being situated in the Borough of Camberwell. The foundation-stone of the St. George's public baths will be laid by Lady Langatock. The plan accompanying the perspective sketch shows the general arrangements of the ground floor of these buildings, which in the working out of the scheme have been somewhat improved, the hall of the site giving greater elevation at the library end. The entrance to the public library is in Neate-street, the porch leading into a top-lighted central hall, where the borrowers' space faces the vestibule beyond the arch below the dormer gable. To the right is the ante-room, and to the left the reference room, with the lending library to the rear—all these departments being divided by glazed screens. In the basement are stores, staff-room, lavatory, and w.c. accommodation for the librarian's use. The baths include 50 slippers, bathe, the women's two classes being on the first floor. The office is central, and the ticket clerk can serve all four departments as well as the laundry. The washhouse accommodates thirty places, and to the front are the mangle-room, bonnet-room, and stairway to the basement. The establishment laundry is placed in the basement, with engineer's shop, boiler-house, mess-room, and other conveniences. Mr. H. L. Holloway, of Union Works, Deptford, is the general contractor. The contract, exclusive of engineering works, is between £18,000 and £19,000. The elevations are in red brick, with Portland stone and Hopton Wood stone dressings. Glazed tiles are extensively used inside, and Broseley tiles for the roofs. Norwegian granite will be used for the baths entrance. Messrs. Maurice B. Adams, F.R.I.B.A., and Wm. Croft, A.M.I.C.E., are the joint architects. Mr. J. Lake is the clerk of works.

OFFICE AND CYCLE FACTORY, COVENTRY.

MESSRS. LEA FRANCES have lately largely added to their premises, and the accompanying view shows their new offices erected from the plans of

Messrs. S. Harrison and Sons, of Leicester, the architects.

THE SARACEN'S HEAD, HOTEL STREET, LEICESTER.

This double-gabled inn has been built from the designs of Messrs. Stockdale Harrison and Sons, of Leicester, in stone, red brick, and slate tiled roofs, in a picturesque and suitable style; but we have no exact details of its arrangements.

HIGHTHORNE, HUSTWATTE, YORKSHIRE.

The original part of the house in stone was built about the time of Henry VIII., being nearly a century old. Alterations have been made from time to time, an addition in brick being carried out during the Georgian period, and at a later date a new wing in stucco was added. The present alterations have been carried out in order to render the house more suitable to modern requirements, but at the same time all the old work has been faithfully preserved. The present hall was originally the kitchen and parlour of the first house. All the woodwork in this part of the house is old, having been cleaned and rearranged. The floor is of solid oak, the angle being paved in brickwork. The whole of the work has been carried out by local contractors. The architect is Mr. Albert E. Kirk, A.R.I.B.A., of Leeds.

ST. PAUL'S, KIPPLING STREET, BIRMINGHAM.

Our illustration represents the perspective view of the plans for the restoration of this church. The original church was built in 1846, and has been repaired only once, some thirty years ago. It consists of a nave, north and south aisles, and a very dwarfed sanctuary. The new plans provide for an entirely new chancel, sanctuary, vestries (both for the choir and clergy), chancel screen, and new choir stalls. The advantage of a stately and well-decorated church in this neighbourhood will be well understood by those who desire the spiritual welfare of the poor, when it is realised that the parish of St. Paul's is one of the very poorest and most overcrowded of all the parishes on the south of the Thames. It was last exhibited last year at the Royal Academy. Mr. Herbert C. Ingram, of Ironmonger-lane, Chopside, E.C., is the architect.

HOUSE AT ALFRETON, DERBYSHIRE.

This house was completed last year. It occupies a pleasant position overlooking a stretch of meadow sloping gently to the river, and a tennis-court was an essential requirement, and for seclusion was placed to the south front. This arrangement suggested the verandah, which affords a certain amount of protection to the living-rooms from the midsummer sun. The walls are in rich red sand-faced brick from Leicestershire. The external woodwork is in deal and oak, and the whole is painted white and varnished. Internally the woodwork of the hall is in well-figured pitch-pine stained green and varnished. An attempt is made to give a little interest to the hall by the design of the stairs: the newels are carried up the trimmer beam, and the space underneath the raking sill is formed into an angle seat, and has accommodation for books. The lighting to hall and lobby is through muffled glazing of a slightly greenish tone. The plastering is distinguished by "baroque," the colour is rich height being Pompeian red. The other rooms generally are furnished with wood cornices, moulded ceiling ribs, and fitted seats to the bay windows; the woodwork is painted and flatted, and the plastering finished in "Duresco" distemper. Cost was a consideration, and economy materials—principally wood and bricks, with very little stone. The work was well executed at a total cost slightly under 6d. per cubic foot. The architect for the work was Mr. Percy B. Houghton, of Chester-le-Street, and the builder Mr. F. G. Charles Scott, of Mansfield.

COLESHILL HOUSE, BERKS.

(See review of "Some Architectural Works of Inigo Jones," on p. 63.)

HULL ROYAL INFIRMARY: SELECTED DESIGN.

These plans were successful in the recent competition for the rearrangement of and additions to the Hull Royal Infirmary. In the conditions laid down for this competition it was required that, while the central administrative block and the north ward were to remain unaltered, except for the modernisation of the sanitary arrange-

ments, provision was to be made for bringing the whole of the patients' accommodation up to date.

The site is a crowded one, and the circular wards were planned with the idea of getting as much sun and air to the buildings as possible, and to avoid the east and west gales which would have been necessary had rectangular wards been adopted. It was an object to retain as much as possible of the present buildings, and the plan shows how the old walls, floors, and roofs have been worked into the reconstruction. This must be remembered in judging of the plan. It was also an object to scheme the alterations so that the various blocks could be carried out in turn without disturbing the working of the other parts of the hospital. The different floors are all arranged on the same principle, the only variation being in the entrance hall, where the ground floor contains an entrance hall and the rooms connected with the reception of patients, the first floor the nurses' dining-room, and the second floor the operating-room with annexes for electrical treatment, anaesthetics, sterilising, &c. The total number of beds is 265. The sanitary annexes are separated from the wards by ventilated bridges, and contain the usual offices, together with a small room for the microscopical and chemical examination of excreta, with ventilated cupboard.

HOUSE, CLARENDON PARK ROAD, LEICESTER.

THIS house is built of bright red bricks, to a little below the chamber window, and above this level to the eaves is roughcast and colourwashed white, so also is the roughcast between the black timber framing of the gables. The roofs are covered with red tiles, a portion of which is continued low down to cover the verandah on the south side, and this forms a shade which is intended to keep the studio cool during the hottest weather, besides forming a protection in the winter to the garden entrance door leading out of this room. The plan is arranged with large entrance hall 14ft. by 16ft. to avoid having any passages, and is lighted by a large mullioned window above the staircase and cool-house roof. The architect is Mr. G. Lawton Brown, of Leicester.

CHIPS.

It has been decided to re-roof Holy Trinity Church, Coventry, at an estimated cost of £1,750.

At Buryley Minster, on Saturday, a new peal of ten bells was dedicated by the Bishop of Hull. The bells which are being hung in the north-west tower were cast by Messrs. Taylor and Co. of Loughborough.

The School Board for Greenock have accepted tenders amounting to £14,480 for the erection of a higher grade school.

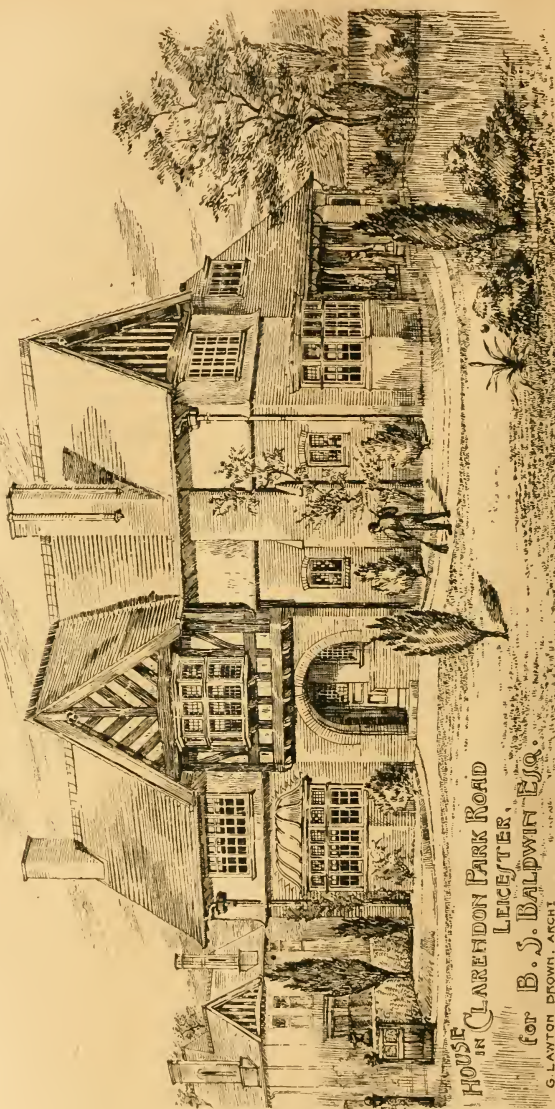
On Friday, the new church of St. Andrew's, Ham, Surrey, designed by Mr. G. F. Bailey, A.R.A., was consecrated by the Bishop of Rochester. Several gifts were at the same time tendered by the Bishop, including the east window, two windows on the north side, a south window, a carved oak pulpit, and the holy-table and priest's stall.

The Lord Mayor, accompanied by the Lady Mayoress, and the Sheriffs paid a visit in full state on Monday to St. John's Wood, and opened the new buildings in Grove End-road of the Hospital of St. John and St. Elizabeth, transferred from Great Ormond-street, Bloomsbury. The new hospital is comprised of 100 beds in places of the 50 or 60 in the former buildings, and comprises well-ventilated wards, lighted by electricity, and furnished with lifts and other modern appliances. The cost has been nearly £20,000.

At the last meeting of the urban district council of Gillingham, the award of Mr. C. T. Smith (valuer for the New Brompton Electricity Supply Works) and Mr. W. H. Teintema (valuer for the council) with reference to the purchase by the council of the works was agreed upon. They had agreed upon a sum total of £26,650.

The memorial-stones of the Bury Infectious Diseases Isolation Hospital were laid on Saturday. The hospital will comprise eight separate pavilions, including administrative, black-tever pavilions, stables, laundry, and porters' lodge, and the estimated cost is about £29,000.

At the quarterly meeting of the Danbigh Lunatic Asylum Committee of Visitors, held on Monday, it was stated that the committee, Messrs. Lockwood and Son, of Chester, were preparing a report on the condition of the buildings for the extension of the asylum left unfinished by the late contractor. It was decided to have the work measured, and to publicly invite tenders for the completion of the undertaking.



HOUSE
IN CLARENDON PARK ROAD
LEICESTER,
for B. J. BALDWIN ESQ.

G. LAYTON DROWN, ARCHT.

Trade News.

WAGES MOVEMENTS.

THE LABOUR MARKET IN JUNE.—The monthly memorandum of the Labour Department is based on 2,321 returns—viz., 1,753 from employers, 624 from trade unions, and 145 from other sources. The general state of employment improved somewhat during June, but remained worse than a year ago. In the 143 trade unions, with a membership of 511,651 making returns, 18,605 (or 3.1 per cent.) were reported as unemployed at the end of June, compared with 3.6 per cent. in May, and with 2.9 per cent. in the 128 unions with a membership of 533,119, from which returns were received for June, 1900. Most branches of the building trades show a slight falling off in employment. The percentage of unemployed union members among carpenters and plumbers at the end of June was 3.3, compared with 3.1 per cent. in May. The percentage for June, 1900, was 2.0. In the furnishing trades employment has declined in most branches. The percentage of unemployed union members at the end of June was 2.7, compared with 2.2 per cent. in May, and 1.6 per cent. in June of last year. Thirty-nine fresh disputes began in June, 1901, involving 10,474 workpeople, of whom 7,450 were directly and 2,994 indirectly affected. The corresponding number of disputes in May was 61, involving 8,632 workpeople, and in June, 1900, 43, involving 22,378 workpeople. Of the new disputes in June, 1901, eight occurred in the building trades. Of the 17 new and old disputes, involving 12,599 workpeople, of which the definite result is reported, 14, involving 8,833 persons, were decided in favour of the workpeople; 15, involving 8,832 persons, in favour of the employers; and 18, involving 1,414 persons, were compromised. The changes in rates of wages reported during June affected 24,560 workpeople, and the net effect of all the changes was a decrease of 1s. 3½d. weekly per head. Of the total number 3,540 received advances averaging 1s. 11½d. per week, and 21,020 sustained decreases averaging 1s. 10d. per week. The net result of the changes reported in the previous month (May) was an average decrease of 1s. 5d. per head in the weekly wages of 37,756 workpeople, and during June of last year, 1900, an average increase of 1s. 6½d. per head in weekly wages was an advance averaging 1s. 6½d. per head in weekly wages of 35,000 workpeople.

THE HARTLEPOOL.—The strike of the Hartlepool joiners, which has lasted over two months, was broken on Friday, the men agreeing to return to work at an advance of 1d. per week.

YORKSHIRE SLATERS.—After negotiations extending over several months the questions in dispute between the operative slaters of Yorkshire and their masters have at length been amicably settled. The threatened strike has thus been averted. Meeting at the Leeds Builders' Exchange, under the chairmanship of Mr. Samuel Worsnop (president of the West Riding branch of the National Association of Slate Merchants), the representatives of both sides spent a day in discussing the new code of working rules drawn by the operatives for adoption throughout Yorkshire, and those suggested by the employers. In the end a set of rules was decided upon, the effect of which will be to refer all matters henceforth in dispute to a joint committee for them to settle by conciliation or arbitration. In the event of the committee failing to agree at any time the grievances under consideration are referred to the arbitration of six members of the National Association of Slate Merchants and slaters and six members appointed by the operatives' executive, who are to hear evidence on both sides, and give a final and binding decision. The men agreed to a universal rate of 9½d. per hour, but the masters declined to concede more than 9d., and ultimately this was accepted. It was unanimously resolved that the working rules should be paramount to those of any federation with which the operatives might be affiliated.

The nave of St. Matthew's Church, Douglas, was solemnly consecrated by the Bishop of Sodor and Man on Friday.

St. Saviour's Church, Falkner-square, Liverpool, internally destroyed by fire in February, 1900, was dedicated anew on Monday, after restoration, by the bishop of the diocese. Messrs. Willink and Thicknesse, of Liverpool, were the architects for the reconstruction.

The erection of the new Art School at the head of Hopewick, Fulmouth, has been commenced the week by Mr. W. C. Hoag, contractor, Redruth. On the ground floor will be a modelling-room, which will also be used for wood-carving and repoussé work, also an elementary room, gentlemen's cloakroom and offices. The first floor will be devoted to a painting and antique room and master's room. Mr. C. C. C. of Penzance, is the architect of the new school, which will cost from £1,100 to £1,200.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Roll-iron Joists, Belgian	23 0 0	23 0 0
Roll-iron Joists, English	9 0 0	10 0 0
Wrought-iron Girder Plates	9 0 0	9 15 0
Wrought-iron Girder Plates	9 0 0	9 15 0
Do., Lorraine, Flat, Round, or Square	20 0 0	20 0 0
Do., Welsh	5 15 0	5 17 6
Boiler Plates, Iron	7 17 6	8 5 0
Best Sheet-iron	13 0 0	13 10 0
Builders' Hoop Iron, for banding	18 10 0	20 10 0
Builders' Hoop Iron, galvanised	13 10 0	14 10 0
Galvanised Corrugated Sheet Iron	18 10 0	20 10 0

	Per ton.	Per ton.
6ft. to 8ft. long, inclusive	12 5 0	12 10 0
8ft. to 10ft. long, inclusive	12 5 0	12 10 0
Best ditto	12 5 0	12 10 0

	Per ton.	Per ton.
Cast-iron Columns	29 0 0	29 10 0
Cast-iron Columns	9 0 0	9 10 0
Roll-iron Fencing Wire	10 5 0	10 10 0
Roll-iron Fencing Wire	8 5 0	8 15 0
Cast-iron Sash Weights	7 5 0	8 0 0
Cast-iron Sash Weights	11 15 0	12 15 0

	Per ton.	Per ton.
Cast-iron Sash Weights	7 5 0	8 0 0
Cast-iron Sash Weights	11 15 0	12 15 0
Wire Nails (Points de Paris)	13 15 0	14 15 0
Wire Nails (Points de Paris)	13 15 0	14 15 0

	Per ton.	Per ton.
0 to 7	8 10 0	8 10 0
8 to 9	9 10 0	9 10 0
9 to 10	10 10 0	10 10 0
10 to 11	11 10 0	11 10 0
11 to 12	12 10 0	12 10 0
12 to 13	13 10 0	13 10 0
13 to 14	14 10 0	14 10 0
14 to 15	15 10 0	15 10 0
15 to 16	16 10 0	16 10 0
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27 to 28	28 10 0	28 10 0
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99 to 100	100 10 0	100 10 0

	Per ton.	Per ton.
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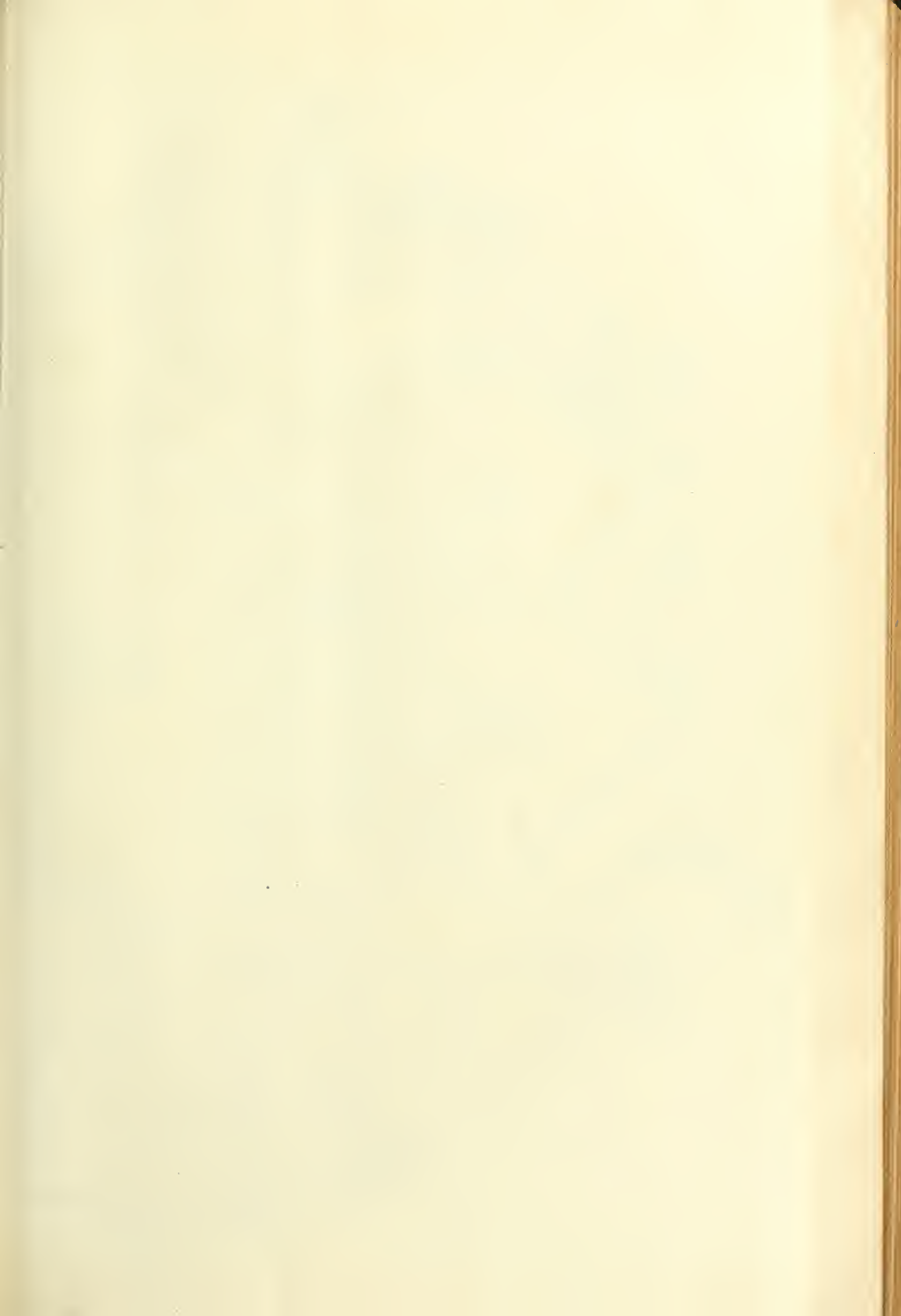
7in. to 24in. (all sizes)	6 15 0	7 0
[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]		
Pig Iron—	Per ton.	

LIST OF COMPETITIONS OPEN.

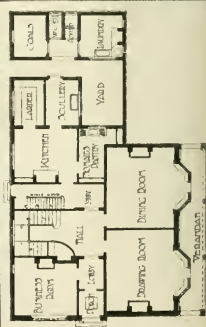
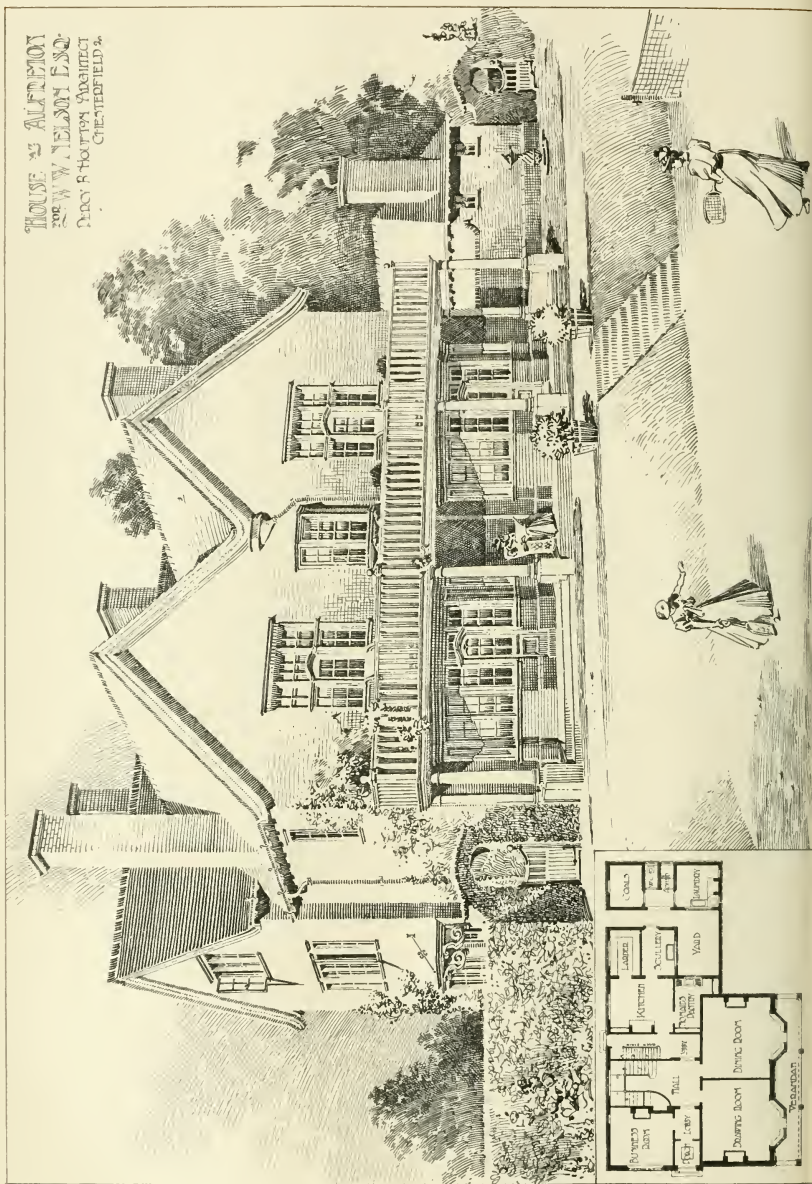
Traut-Sewage Disposal Scheme				Robert Dobell, Town Clerk, Truro	July 20
Blaird-Market Hall, Council Chambers, &c., Market-st. (area 60ft. by 34ft.; limit £2,000)	£20				
Manchester - Police Station, &c. (£75,000 limit)	£200, £200, £100				
Everett - National Hall	£10 10s.				Aug. 1
Redhall - Alterations to Church					31
Penzance - Laying-out Ground on Western Promenade	£21 merged, £10 10s.				Sept. 1
W. Fulford - Public Baths and Wash-house	10sigs. (merged), 3sigs., 3sigs.				Oct. 1
Dudley - Twenty Workmen's Dwellings					
St. Peter Port, Guernsey - School 750 places					

LIST OF TENDERS OPEN.

BUILDINGS.		BIDDERS.	
Thames - Bank Extension	York City & County Banking Co., Ltd.	T. E. Marshall, Architect, Harrogate	July 20
Coventry - Dining Hall, and Additions to Workhouse Infirmary		T. B. Farrington, Architect, Trinity-square, Llandudno	" 21
Fondland Estate - Farm Offices		Davidson and Garden, 12, Deo-street, Aberdeen	" 20
North - Rebuilding Tynrhyl Arms	E. Evans Buva	J. Cook Rees, Architect, South Wales	" 20
Crumlin - House		R. L. Roberts, Architect, Aberystwyth	" 20
Cleveland - Alterations to Kent National School		J. Taylor, Lower Queen's-road, Cleveland	" 20
Melgum Estate - Alterations to Offices, Millhead Croft	A. C. Beale and Sons	James Sellers and Son, Architects, Union Chambers, Bury	" 20
Killybegs - Completing St. John's Church	Lord Bishop of Ossory	Davidson and Garden, 12, Deo-street, Aberdeen	" 20
Monaghan - Alterations to Office at Boat of Auchenahilly		W. H. Byrne, M.R.I.C.E., 22, Suffolk-street, Dublin	" 20
Stronachlach, Lord Kaituma - Alterations to Inverlyde House	Glasgow Corporation	Davidson and Garden, 12, Deo-street, Aberdeen	" 20
Melgum Estate - Keeper's Cottage and Kennels		J. M. Gale, Engineer, 45, John-street, Glasgow	" 20
Langside - Rebuilding and Extending	Properties Committee	Davidson and Garden, 12, Deo-street, Aberdeen	" 20
Caishie Estate - Alterations, Meal Mill		T. C. H. Hughes, Town Clerk, Llanelli	" 20
Resolven - House	A. Norton	Davidson and Garden, 12, Deo-street, Aberdeen	" 20
Darlington - Extensions to Training College	Guardians	J. L. Smith and Davies, Architects, Aberdare	" 20
Erewham - Workhouse Infirmary		P. Pritchett and Son, Architects, 10, Fawcett-street, Darlington	" 20
Woolston - Police Station		Edward Wadams, Clerk, Union Offices, Evesham	" 20
Chesham - Pair of Semi-detached Villas	J. Cole	W. J. Taylor, County Surveyor, The Castle, Winchester	" 20
Cacknach, Aberdeen - Farm Offices		W. H. Hill and Sons, Architects, Cork	" 20
Ballynah - Rebuilding and Repair Shop	Greenock & Port Glasgow Tramways	Davidson and Garden, 12, Deo-street, Aberdeen	" 20
Dunroch Estate - Alterations to Newfield Croft House	Committee	P. Hewer, 33, Cathcart-street, Greenock	" 20
Ballynah - Reconstructing Unitarian Church	Corporation	Davidson and Garden, 12, Deo-street, Aberdeen	" 20
Aberystwyth - To Three Shops, Clarks-street		James Ferguson, Architect, 13, Union-street, Belfast	" 22
Nuneaton - Refuse Destructor at Sewage Works	Nuneaton and Chivers Cotton U.D.C.	J. Watson, Quantity Surveyor, Cogan Chambers, Bowley-lane, Hull	" 22
Blackburn - Extension of Electricity Works		S. F. Pickering, A.M.I.C.E., Surveyor, Nuneaton	" 22
Redding - School	Electricity Committee	M. P. McKellen, M.R.I.A.I., Architect, 30, South Mall, Cork	" 22
Princes - Extensions, &c., Princess Alice Coffee Tavern	Grangemouth Parish School Board	A. S. Giles, Electric Engineer, Jubilee-street, Blackburn	" 22
Caterham - Additions to Asylum Laundry	Metropolitan Asylum Board	Alexander Gaud, Architect, Vicar-street, Falkirk	" 22
Aberlert - Hotel, Six Belle-road	J. R. & T. A. Webb, Ltd., Aberdeen	T. Watson, Architect, Station-road, Balby	" 22
Chesham - Rebuilding and Extending, Electric Light Station		T. Duncombe Mann, Clerk, Embankment, E.C.	" 22
Sheffield - Brassfoundry, &c.		F. R. Bates, Architect, 22, Westgate Chambers, Newport, Mon.	" 22
Beckham - Black Transformer Station, Durham-avenue	Tramways Committee	T. B. Farrington, Architect, Trinity-square, Llandudno	" 22
Warrington - Rebuilding Fire Station	Urban District Council	C. F. Wike, C.E., City Surveyor, Town Hall, Sheffield	" 22
Ramoth - Shoe Factory	Corporation	John A. Angell, Surveyor, Beckenham	" 22
Nuneaton - Stables, Queen's-road		H. J. Hump, Borough Surveyor, Town Hall, Swindon	" 22
Edmond - Station House	Nuneaton and Chivers Cotton U.D.C.	Adams Bros., Boot Manufacturers, Runcorn, Northants	" 22
Cardiff - Three Cabmen's Shelters	Corporation	S. F. Pickering, A.M.I.C.E., Surveyor, Nuneaton	" 22
Manchester - Victoria Station Extension	North-Shropshire Ry. Co.	J. H. Harding and Son, Paddington Station, London	" 23
Bradway - School and Office	Ards No. 1 Rural District Council	W. Harper, M.I.C.E., Borough Engineer, Cardiff	" 23
Edmondstown - Labourer's Cottage	Great Western Railway Co.	The Engineer's Office, Hunt's Bank, Manchester	" 23
Laura, Plymouth - First and Police Station		George Norton, Architect, Alliance Chambers, George-st., Sheffield	" 23
Upton - Goods Yard at Sidings	North-Shropshire Ry. Co.	Louis Tourley, C.E., 17, Laurence-street, Drogheda	" 23
Kingsley - Offices and Workshops, Cook-lane	Glasgow and Yorkshire Ry. Co.	G. M. Mills, Secretary, Fiddington Station, W.	" 23
Pitt Hill - Alteration of Premises	Glasgow and Yorkshire Ry. Co.	James Fison, Borough Engineer, Plymouth	" 23
Chesham - House, Stockport - Six Workmen's Cottages	Corporation	The Engineer's Office, Hunt's Bank, Manchester	" 23
Liverpool - Goods Yard, &c.	Corporation	The Gas Office, Low Bridge	" 23
Sharnbrook - Union Church	Corporation	Rev. W. Bailey, Sec. View, Sharnbrook	" 24
Kingsbury - Schoolroom, &c.	Parish Council	Hudson and Hunt, 40, Upper Baker-street, Kingsbury, Middlesex	" 24
Glasgow - Lodge and Waiting Rooms, Ruchill Park	Parish Council	E. T. Macdonald, City Engineer, Office of Public Works, Glasgow	" 24
Manitah - Buildings and Walls at Barnhill Cemetery	Parish Council	J. MacLaren and Sons, Architects, 24, Bank-street, Dundee	" 24
Mill - Stables, &c.	Parish Council	William Bell, Architect, York	" 24
Kirkby Lonsdale - Two Houses, Bettice-road	North-Eastern Railway Co.	John Hutton, Architect, Kendal	" 24
Poplar, E. - Medical Officers' Residence	Guardians	J. and S. F. Clarkson, Architects, 130, High-street, Poplar, E.	" 24
London, E.C. - Locomotive Shed	East Indian Railway Co.	C. Young, Secretary, Nicholas-lane, E.C.	" 24
North - Vicarage House	School Board	R. T. Hoolway and Sons, Architects, Bridgeland-st., Bideford	" 25
York - Lodge and Discharge Block at Fever Hospital	Corporation	Geo. F. Halliday, F.R.I.B.A., 14, High-street, Cardiff	" 25
Leicester - Live-stock Market, Exchange, Sussex-street	Corporation	Alfred Croser, City Engineer, Guildhall, York	" 25
Pockham Ry. & E. - Works at No. 43, The Gardens	St. Olave's Union Guardians	McNair's Architect, Cavendish-street, Derby	" 25
Leicester - Office, &c., New-road	R. W. Evans	Newman and Newman, 31, Tooley-street, S.E.	" 25
Bideford - Additions to Book House	A. J. Lewis	Thomas Arnold, Castle Buildings, Llanelli	" 25
Swancombe - Street Baptist Meeting-Room	C. White	T. B. Hoolway and Sons, Architects, 24, Bridgeland-st., Bideford	" 25
Roskilly - Four Houses and Shops	Baths Committee	W. H. Salmon, Architect, Swancombe	" 26
Salisbury - Covered Way at Infirmary	Gloucester School Board	E. Richards, Architect, Tormoham Manor Office, 7, Strand, Torquay	" 26
Leicester - Removable Gymnasium Floor, Bath-lane Buths	Metropolitan Asylum Board	J. H. Harding and Son, Architects, 26, High-street, Salisbury	" 26
Leicester - Additions to Bernard's Heath Schoolhouse		G. H. Russell, Station Buildings, St. Albans	" 26
Drumthelm - Teacher's House		George Gregory, Architect, Stanchewin	" 27
Leicester - Mortuary at Asylum		T. Duncombe Mann, Clerk, Embankment, E.C.	" 27
Rhonda Valley - Farm and Police Station		Arthur and Jones, Architects, Tonbridge	" 27
Aberystwyth - Rebuilding Farmhouse at Bowles' Barn Farm	Monmouthshire Asylum Committee	B. J. Francis, Architect, Aberystwyth	" 29
Glasgow - Extension of Central Station	Caledonian Railway Co.	J. Blackburn, Secretary, 392, Buchanan-street, Glasgow	" 29
Walsfield - Additions to Technical School	Walsfield School Committee	John Smith, Borough Surveyor, Berris	" 29
Berris - Kirkham Improvements	East Suffolk County Council	H. Miller, M.I.C.E., County Surveyor, 16, Museum-street, Ipswich	" 29
Leicester - Additions to Police Station	Leicester City Council	Arthur and Jones, Architects, Tonbridge	" 29
Bury, Lancs - Lodge and Police-Houses Extension	Guardians	Ashton Veall, Architect, 44, Darlington-street, Wolverhampton	" 30
Canwick - Workhouse Infirmary	Guardians	Richard Arnold, 3, Wilbert-lane, Beverley	" 30
Leicester - Repairs to White Hart Inn	Town Council	John Parker, A.M.I.C.E., City Surveyor, Lanson House, Hereford	Aug. 1
Leicester - Repairs to Cottages		H. Bewick, County Architect, Newgate-street, Chester	" 1
Parkside, Macclesfield - "Epileptic Ward and Nurses' Home	Rural District Council	Henry Card, A.M.I.C.E., 10, North-street, Lewes	" 3
Leicester - Leion Hospital	Corporation	Barnes and Coates, A.R.I.B.A., 41, Fawcett-street, Sunderland	" 3
St. Ken's - Additions to Naval Reserve Public-House	W. and T. Bagge	Herb. Tison, Architect, Railway-road, King's Lynn	" 3
Birkenhead - Board Office, &c.	H.M. Commissioners of Works	Edmund Kirtley, F.R.I.B.A., 7, Cook-street, Liverpool	" 4
South Kensington - Superintendence of Royal College of Science	Isle of Wight U.D.C.	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 4
Portsmouth, I.W. - Literary and Technical Institute	Merthyr Tydfil U.D.C.	F. Newman, County Surveyor, St. Thomas-street, Ryde, I.W.	" 5
Merthyr - One Hundred Houses at Penryn	Llandaff School Board	James Chalmers, Manager, Town Hall, Merthyr	" 5
Leicester - School	Corporation	John Vaughan, Clerk, Town Hall, Merthyr	" 6
Leicester - School	Guardians	Edgar Down, A.R.I.B.A., 31, High-street, Cardiff	" 6
Paddington, W. - Mortuary Buildings and Chapel	Borough Council	Edgar Down, A.R.I.B.A., 31, High-street, Cardiff	" 6
Leicester - Five Houses		Edgar Down, A.R.I.B.A., 31, High-street, Cardiff	" 6
Greenock - Three Cottages	Greenock & Port Glasgow Tramways	The Surveyor's Department, Town Hall, Paddington, W.	Sept. 18
Brantford - Three Tenements	Ernest Prater	S. Moore Chadwick, Architect, Bindloss Chambers, Manchester	" 18
Warrington - Villa	Equitable Industrial Society	W. G. Little, Donington House, Norfolk-street, Strand, W.O.	" 18
Moston - Conservative Club		R. and T. Watson, Surveyors, 5, York-place, Edinburgh	" 18
York - Branch House, Lowther-street		Greenhalgh and Brockbank, Architects, Bindloss Chambers, Southend	" 18
Edinburgh - Extensions and Additions to County Asylum		S. Moore Chadwick, Architect, Bindloss Chambers, Manchester	" 18
		Athorn and Beck, Architects, Doncaster	" 18
		Silvanus Torvald, F.R.I.B.A., Architect, Truro	" 18



HOUSE & ALFRED
 FOR W. NELSON ESQ.
 100, A HORTON ROAD
 CHESTERFIELD 4.

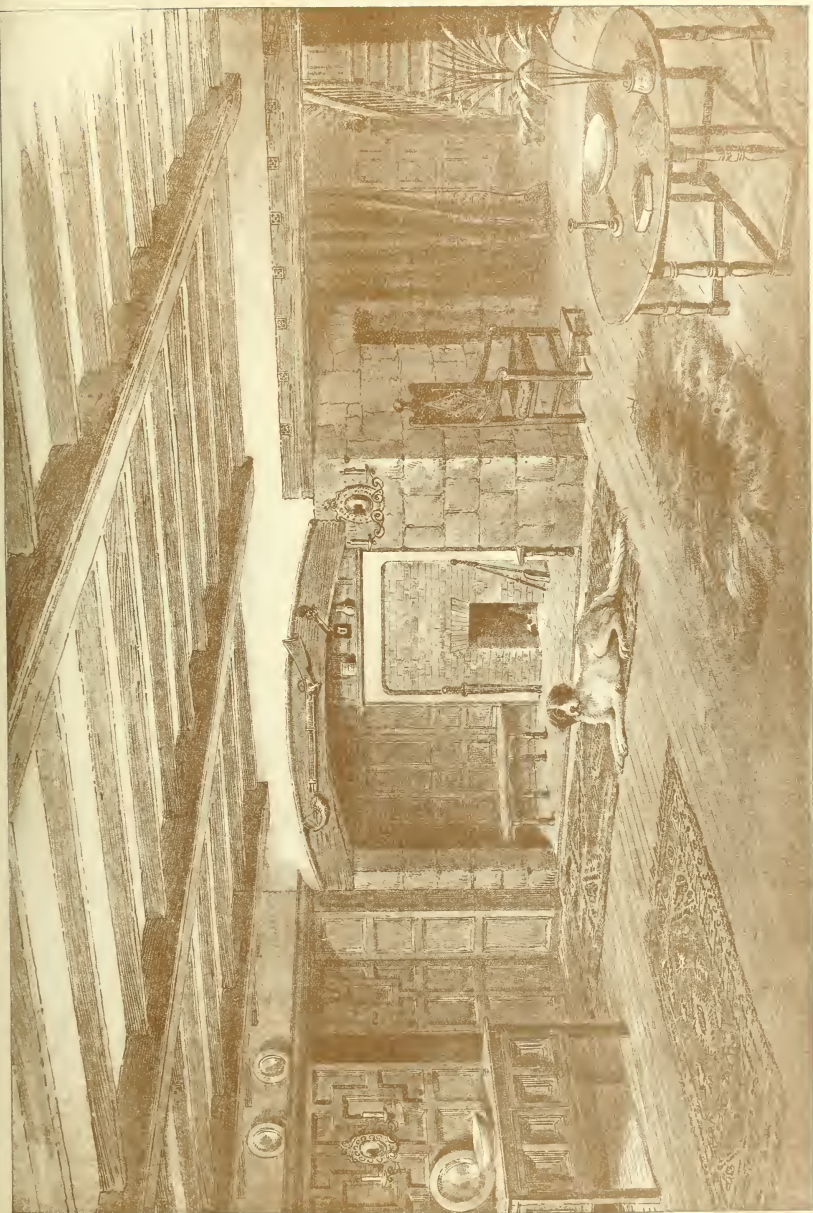






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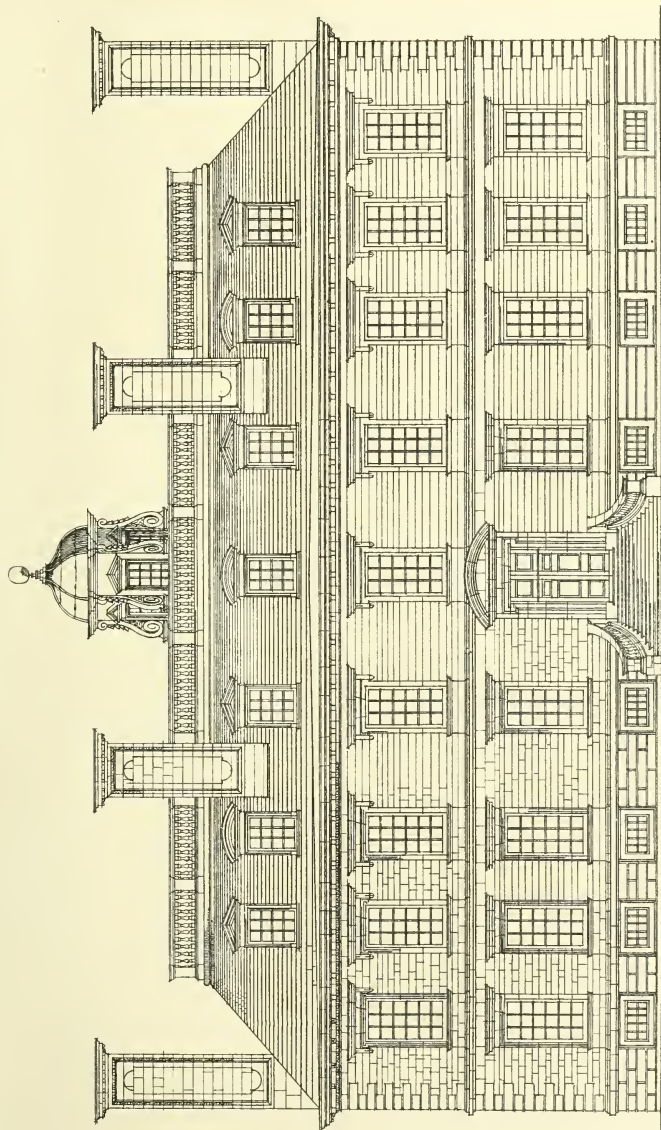


INTERIOR OF HALL HIGHTHOENE MUSTAWAITE YORKS - A-E-KIEK ARJAT

PHOTO TINT



COLESHILL HOUSE BERKS DRAWN BY A. INIGO JIGGS AND HENRY TANNER.
FROM "SOME ARCHITECTURAL WORKS BY INIGO JONES"





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CERTIFICATES AND THEIR EFFECT.

OF the many responsible duties which fall to the architect are those of assessing the value of work done under a contract and of issuing certificates. From a superficial view, these may appear easy and perfunctory duties, and probably for this reason the subject is not considered to be of much moment. But as it is provided in building contracts that payments are only to be made on the certificate of the architect, that the work is being carried out to his satisfaction, the full extent of the responsibility becomes apparent, for the issuing of a certificate pledges the architect to use his judgment and discretion in satisfying himself that the contractor has done work and used materials that have entitled him to it. And this implies a knowledge of the works in progress—how far they have advanced, a careful supervision of the building periodically, and an estimate, approximately, of the amount of material used and labour expended. The quantity surveyor sometimes makes a report for certificates; often it is a duty that devolves on the clerk of works, who bases his report on the priced quantities, or the work has to be valued at certain rates. At intervals this measurement and valuation has to be made of the works actually executed besides a careful record of each valuation, to prevent confusion and after-disagreement.

It may be done by preparing a set of tracings of the building, and distinguishing by a tint the portion that has been valued and reported on. The architect should be furnished with a weekly report of progress made during the week, recording the number of men employed in each trade, the value of the work done since the last report, whether the progress has been satisfactory, the kind of material, and other particulars. By these reports he is able to obtain reliable information, so that when he certifies the contractor, he is in a position to act. Many architects who do not employ a clerk of works have to do the work themselves as best they can; they have to pay more frequent visits to note the progress made, and to ascertain by rough methods of measurement the value of the material and labour expended. When it is considered that the certificate of the architect binds both the building owner and the builder, it will be seen that the granting of a certificate is no light matter; that it involves careful supervision or inspection of the material on the site, and a calculation of value. We believe this work is often guessed at. The specification or contract defines certain stages of the work at which the contractor is entitled to a payment—as, for instance, when the ground-floor or first-floor level is reached; when the ceiling joists are put on, or the roof has been constructed and covered in; a further payment when the work is completed, and the final payment when the building is complete. These stages of the work afford in ordinary house-building a fair means of dividing the instalments, as the material and labour can be ascertained beforehand; but in large and complex buildings no arbitrary divisions can be made, and it becomes necessary to make the instalments when work to a certain value has been executed, or at the rate of so much per cent. of the value of work so executed, thus keeping safely within the bounds of discretion. This is continued till the balance retained in hand amounts to a certain sum named, after which

the instalments continue to the full amount of the work executed. When the building is completed, the architect gives a certificate for a part (say half or more) of the sum retained as above, and after a period of, say, two or three months he gives a certificate for the balance. The amounts to be filled in, or the rate per cent. of the value of work to be paid, are matters that have to be carefully thought over when the contract is prepared. The position financially of the contractor must also be a consideration. A builder of small capital will be able to do more justice to the work and to himself if the instalments are at frequent intervals, and so long as the architect retains a certain per cent. there can be little risk. The want of adjustment of these points after the tender has been accepted may cause much friction and unpleasantness, and it is better to alter the mode of payment to meet the wants of the contractor than to adhere to the conditions in many instances. The form of clause in the schedule of conditions issued by the Royal Institute of British Architects may be adopted, though many architects prefer to use their own form. Of course, what are termed "progress" or interim certificates are not of so momentous or binding a kind as the final certificate, and it is on the granting of this instrument that so much depends, and so much litigation occurs. Of course, the contractor is anxious to obtain his final certificate as early as possible, as it practically releases him from further obligations under the contract. The architect has in this duty a responsibility of some weight; his client may be a troublesome and interfering man, who endeavours to use his influence to induce the architect to withhold the certificate for some trivial or insufficient reason; it may be because he thinks that delay will compel the builder to do more work. More frequently the contractor urges the architect to give the final certificate before it is strictly due, or before the work is completed to his satisfaction. The experienced architect knows the result of complying too soon, or before he has thoroughly satisfied himself of the work. The contractor may even use threats to take proceedings; but legally he has no grounds if it cannot be proved that the certificate has been fraudulently withheld in collusion with the employer. The quality and conclusiveness of the certificate between builder and owner, even if it has been given without much care, has to be remembered; but this should rather make the professional man more vigilant and careful than otherwise. In one instance, "Stevenson v. Watson," the architect was careless and negligent in performing the work required to give a certificate, so that the builder did not receive all that was honestly due to him; but it was ruled that he could not bring an action against the architect, as there was no evidence of fraud or decision that seems very hard on the contractor. The owner is the sufferer from want of negligence on his architect's part, is not the latter liable? On this point the law is not very explicit: in "Rogers v. James," the architect was regarded as an arbitrator in deciding disputes or amounts payable between builder and owner; but he was liable to the owner for want of care in regard to giving certificates. The architect had not detected a sufficient sum from the amount payable to builder in respect of omissions by him. Another decision protects the architect because of his judicial position—he is under no liability to the owner for such; in fact, it is assumed the parties agree to his judicial functions, and therefore the client cannot claim damages against the architect in his capacity of agent for what he has done in his capacity as arbitrator. These are opposite legal conclusions which are hardly worth remembering. The two functions of arbitrator and agent are generally very intermixed in the contract

relation between architect and building owner. If the architect acted only in the capacity of agent of the owner, he would be liable for negligence; but in the capacity of arbitrator he is not liable. The judgment in "Chambers v. Goldthorpe" seems to be based on a sound principle. Yet these decisions ought not to be too implicitly relied upon. The architect in the giving of his certificates is called upon to exercise a reasonable degree of skill and judgment, both for the protection of his clients and the builders. The final certificate has, of course, an important bearing on the question of extras. Thus, if the architect gives a certificate allowing extra work, it establishes the claim of the builder, even although no written orders have been given. There have been instances where the architect has overlooked this effect of his final certificate, and it is necessary to protect the owner from the extortionate demands for extras by the insertion of a clause to this effect: that no certificate of the architect is to be considered conclusive evidence as to the right of the builder to charge for work for which no written orders have been given. One course that is at least straightforward is to get the contractor to furnish a list of items in respect of which he considers he is entitled to extra payment. This is handed to the surveyor, who measures up the work, and estimates the real amount due. The architect then examines it, making all necessary corrections, submits it to his client and to the builder before the final certificate is made, so that all unnecessary disagreement as to the amounts due is avoided. A more independent course, in which neither building owner nor contractor is consulted, often leads to unpleasant disputes.

TRADES AND METHODS: A CONTRAST.

NATIONAL prejudices are hard to shake, and it is not therefore remarkable that with regard to our industries and engineering enterprises the Englishman finds it so difficult to believe that Continental and American workshops and workmen are outstripping us in many directions. From the early part of the last century till the Great Exhibition epoch, British industries were associated with our progress as a nation; the politicians of the day generally coupled political freedom and our world-wide industrial progress together. Times have somewhat changed since then, and our great manufacturing firms are being told plainly, and with some degree of complacency, that German and American workshops and workmen are leaving them far behind. Still, the English manufacturer does not feel much to be alarmed at, and believes that much of what he sees in print is a little of a sleepy trade and keep us up to date. But the evidence of eye-witnesses and special correspondents of the *Times* is not at all exaggeration, and we are at least bound to accept facts as recorded by reliable witnesses, make our own comparisons, and draw our conclusions. Certain facts are ascertainable, such that the British iron industry is nothing compared with that of the United States and of Germany, and that the American engineering establishments leave us far behind. As an American writer lately said, speaking of the trade triumphs of his own country: "Many of our initial successes in international trade are due in a large degree to the accident of circumstance; but after making all due allowance for such cases there remain others, like the Athlone Bridge, which can only be explained by the existence of superior methods of production." We lately mentioned a few of the old school can with difficulty realise both the extent and the perfection of the appointments of the American Steel Works, which

are vastly larger than those of this country, and can turn out steel structures in a less time than many here would be thinking about them. We are not saying that mere magnitude of business operations and speed are qualities that commend themselves to English minds, or that because of such advantages the American structures surpass our own; we believe, on the contrary, that largeness of industry and greatness of speed of production are almost in an inverse ratio to the art qualities; but we have to look facts in the face. There is a danger of the manufacturer displaying indifference to the competition and rivalry to which we are yearly more subjected by those across the Atlantic and in Germany. In a recent article we noticed a few of the reasons why the American designer and constructor have taken a lead in engineering works. One was the adoption of piecework in the workshops, which was followed in a spirit of harmony between employers and workmen rare in England; then our Transatlantic friends encourage talent and reward it—the youthful craftsman or engineer is encouraged; in this country he is paid according to his age. We know how many young men have been sent to the technical college courses of our technical schools, and have spent a large sum in education and equipment, can only get a situation in a drawing office at a small salary, below the wages of a mechanic. The opposite course is followed in the State. The young man is paid according to his ability, not according to age, and the consequence is that efficient skill is brought to bear on new problems, and the Englishman who cannot find employment at home can obtain the best positions abroad in office and workshop, and then go back to production in England as Government inspectorship, such as that imposed by the chief engineers of Great George-street, and by Government authorities. One example of this is the large factors of safety demanded in structures, that increase the cost sometimes out of all proportion to the requirements. The foreign contractor is thus enabled to tender at a lower rate, and give in a lower tender. All this is a loss to the mother country. Then specialisation is carried to a larger extent in America than in this country, where the engineer undertakes all kinds of construction—railways, bridges, buildings for special purposes, and the like; the result is that he is unable to compete with the American specialist, and every detail is left to the contractor. The office system is predominant here; but in America the workshop and office co-operate. The subdivision of work has been inimical to real progress in construction and design. The engineer or architect confined to his office engages in a variety of branches of work, and is followed by specialists who have devoted themselves to their particular duties. A great deal of the detail work is necessarily left to the contractor, who cares nothing for the design and endeavours to hoodwink the engineer at every turn, if by so doing he can make an extra or secure a profit. The employment of specialists, whatever its disadvantages, has at least the merit of obtaining the essentials of economical design and workmanship, and gives less opportunity for disputes and expensive arrangements. In this way the American engineer or contracting firm has the advantage over the British competitor. In this connection we must refer to a report that appeared in the *Times* a few days ago of a visit to recent workshops in Germany by a representative of a great manufacturing firm in this country. The report has special value and interest for not only manufacturing firms, but for all interested in good workmanship. We give the general gist of the report as printed. Under the head of Works, the writer says: "The work was well arranged; each department was self-contained, no traffic of men from one

department to another; economy in transit of material, good light and ventilation, and method of drawing dust from machines. Every provision made for the personal cleanliness of the workmen. The workmen are said to be "clean, orderly, with steady hands and great delicacy of touch; full of interest in their work, working steadily from bell to bell, and never taking advantage of the foreman's absence." As to quality and cost of machining, the machines are "kept in beautiful working order, with great economy in use of oil and stores generally. One man working two, three, or four machines, according to the nature of the work." The writer says he watched the application of the various tools, timed the operations, and gauged the quality of the work, which he found to be excellent, both turning, planing, milling and boring, and he says their cost of machining would be about one-half the cost of that here. The German tools are said to be very accurate; also the method of using them. "Those for gauging and testing are of the most improved kind, giving a positive reading to a much finer degree than ours. Cutting-tools for giving correct form of thread, &c., are excellent, and enable the workman to proceed with great accuracy. The writer also observes that the workmen at the shops he visited appeared to be trying to do their best—not, as is often the case here, only what is necessary to pass muster." These plain and disinterested acknowledgments of the superior equipment and working of German workshops ought to open the eyes of the most prejudiced; and the last statement is a damaging admission of the want of interest shown by the average workman that must be taken into account in considering the results. We cannot admit that the writer is fully justified in the remarks made by an English workman against his own class. Both in the *personal* and the material the report speaks in the most unequal terms. Indirectly indeed, it impeaches our own workshop arrangements, equipment, and the ability and competence of our workmen. It has been long an open secret that we are behind in our machine-shop management compared with both Europe and America. A writer on the subject some time ago pointed out the better environment and opportunities in America for the sons of workmen, and that it is much easier to secure a number of skilled workmen with advanced ideas in America than in Europe. The same writer remarks, "The average English, German, or French working man's son, throughout his school life, his apprenticeship, and his work as a journeyman, does not associate with anyone outside his own class." He is a working man, and seldom thinks of becoming anything else, and these conditions are not calculated to produce skilled workmen. His ideas are limited to his work. On the other hand, American living and wages are the cheapest in the world; the apprentice has an all-round training, and is allowed to work in every department of the shop; hence he can adapt himself to various kinds of work, and settles down perhaps as a specialist. Thus it is found in the manufacture of machine tools and in other mechanical industries a division of labour is necessary in the production of the best work, yet it confers training in the various special operations for the operative ought to be able to know whether the previous operation is right before he can undertake his part. The report on German workshops makes it clear that for certain kinds of construction accuracy and perfection of workmanship can only be attained by self-contained departments, perfect machines, and a certain degree of specialisation of labour. Above all, the worker must have a personal interest in his work.

But when we pass to architectural and more artistic construction, other considerations have to be taken into account. The

"personal factor" is necessary. If we draw any conclusions from the evidence that has been afforded of American and European moles of working, we must be convinced that the division of labour in which our Transatlantic cousins are so advanced, if properly organised, is the most economical method of production in certain things; but we see also, as one writer has forcibly put it, "The factory and machine shop hand is becoming the slave of the automatic machine and the model shop. No diversity in his labour, no development in his mind, no progress from his experience. This is the danger to American workers,"—and has not the same caution been preached by Ruskin years ago, when he said this subdivision of labour was making men "but segments of men"? We can over-ride till all the interest of the workman is lost. In a land of large factories and enormous combinations and specialisation there is no room for the art development, and what art there is mainly derived from other countries.

On our side we have, on the contrary, organised labour combinations which are opposed to progress in the mechanical trades and to individual effort. Both systems tend to suppress the individual worker, and social and economic conditions are neglected for perfect machinery and increased production. A machine or a tool requires accuracy of make, smoothness, and finish, best accomplished by a separate treatment or subdivision of labour. On the other hand, in the architectural crafts, harmony and genuine proportions are secured by single craftsmen doing the whole. The instruction given in the Central School of Arts and Crafts is based on this principle of wholeness or completeness in the training of each craftsman; now, as it often occurs, only one process or branch of his trade, to the neglect of other parts—a principle, it will be seen, in complete antagonism to that adopted in the large American factory. To sum up these conclusions.

Subdivision kills art, for it neglects the human factor, and in its place it puts the machine. We want definite teaching—the operations special for the end; but we must find it not by subjugating the worker to a contractor, but in giving him greater interest and responsibility. The hard and fast line between designer and workman must be relaxed. Our American cousins employ experts, not general contractors, to do their work; but our tradition in Great George-street and elsewhere has been to lay down hard and fast rules to draw designs and prepare specifications for structures and bridges, and to get contractors to tender from them, and to implicitly follow the instructions. We have here a kind of specialisation that is quite antithetical to the best results of the professional or Government engineer or architect giving designs for a great variety of works of which he cannot know a great deal, and a general contractor whose work is to find the capital and the men at the least cost. We know the results of such a combination. A writer says: "In Westminster there are civil engineers who will design a whole railway in their office—bridges, stations, permanent way, locomotives, &c.—and all sorts of the impertinent contractors who submit that any detail is capable of improvement." And the drawing, he goes on to say, are "not designs at all, but merely copies of former practice"—methods and details pieced together to suit the occasion. We cannot call this specialisation; it is, rather, undertaking to do any kind of work from a railway to an electric plant, and to get a contractor to carry it out. Let us have our experts in engineering and architecture—men who are specially skilled in one or two branches of their profession, but who have nevertheless, been trained to other branches; and let us train our workmen for their trades, not as mere machines,

without any interest in any other operation than one, and we shall then get our buildings and manufactures carried out on better lines. Subdivision of labour, complete factory machinery and equipment, and good organisation may give us mechanical qualities valuable for machinery and manufacture; but without the thought and handwork of the human factor, we cannot expect from them any artistic production.

PREPARATION OF SKETCHES.

THE preparation of sketches for an employer contemplating building is a usual and fairly reliable means of representing the effect of a design. It may not be the most judicious in some cases, as, for instance, when the client is a person incapable of making up his own mind, or when any attempt is made to exaggerate or add to the effect by tricky sketching to captivate a person not able to understand drawings. For, curious as it may seem, there are some persons quite incapable of interpreting drawings, however clear—who have a sort of visual blindness in apprehending the conventional methods in use, such as those of plans and elevations and even perspectives. Many architects must have come across people of this kind, who can understand a model or a building erected, but who cannot realise the effect of a perspective view. But with the majority of people a sketch is a more popular way of showing what is intended than a set of plans and elevations;—it is better understood, as it represents the building in the solid with its main fronts in due relation to each other; it is also an easier way of appealing to the employer's taste, and it saves the architect the labour of preparing a set of drawings at once. But, for some reason, the employer thinks that a sketch is not worth paying for, if he changes his mind. An architect is asked to give a plan for building, say, a villa on a country estate. The requirements are roughly stated by the employer, and the architect proceeds to prepare plans in pencil, and sketches too small scale. These are sent to the client, who wishes a few alterations in the plan. They in turn are made, and another set of plans and sketches is available for the client. In the meantime he wishes the architect not to proceed with the drawings till he has made up his mind as to the site. The architect waits patiently for some months, and writes again, to hear that his client has got a builder to erect a house that will suit him. But the sketches made are not returned till after a request has been made. The end of it all is, that the employer has surreptitiously used the ideas in the building he has erected with the aid of the builder, and refuses to pay for sketches that he says have been of no use. Such a case has occurred again and again. In another instance, the client, after receiving the sketches, places them in the hands of a friend, who builds a house on similar lines. The sketches are ultimately returned to the architect with thanks.

One use to which the sketch design is often put is to advertise a company, a new theatre or public building, a row of shops and offices, or to attract tenants to a new estate. In this manner, also, the architect is often the victim. He is led to put the ideas of the client or company into shape, to formulate a new scheme for, perhaps, a row of shops, or an arcade;—a design or sketch is as necessary as the prospectus. The architect prepares a sketch plan and view; these are at once adopted, and ordered to be lithographed or reproduced by photo process. The work entails thought in the planning, and such artistic skill in the perspective view, which may be coloured or in plain lines. After considerable efforts have been made to float the company, the scheme collapses; the

shares are not taken up, and the services and skill of the architect are repudiated by the promoters of the scheme. It is not generally known that under the Companies' Clauses Act, 1845, only directors or a committee of such can enter into a contract; and that the corporate seal of a company must be affixed to make them responsible. As a matter of fact, a secretary has little or no authority in these matters, so that it is important for an architect who prepares a design for a company, or a contractor who enters into a contract with one, that any such undertaking should be under seal; but, as a matter of fact, the architect's labour is generally finished before the company is in existence; he receives his authority from a prominent promoter, who, in the event of failure, is ready to back out of his obligations, and no one is responsible for the design. Thus it is the architect's services are thrown away, unless he has made some special contract with those who have instructed him.

An instructive instance of an architect's claim for sketches "to attract tenants" was lately heard at the Croydon County Court. The facts were briefly these: The plaintiff was an architect at Purley, who, at the request of the defendant, prepared sketches for some houses she proposed to let built. The sketches were intended for exhibition with a view to attract tenants. The plaintiff was asked to waive his claim for the sketches if the defendant employed him to prepare the plans and specifications for the houses, fifteen in number. He consented, and prepared them; they were, however, rejected by the defendant, who employed another architect. The case was referred to the President of the Royal Institute of British Architects to appoint an arbitrator, and Mr. Hilbert Nash was appointed. The general rule made an award in favour of the plaintiff, and judgment was signed for £37 10s., and costs, the first charge for sketches being twelve guineas. The case is instructive, as it shows the desire of clients in many cases to get out of paying for sketches. As a matter of fact, these contain *in embryo* the ideas of the architect, who ought to be remunerated. But the ordinary employer has the idea that a sketch involves little skill or labour in preparation;—it is available for any order. The profession should do all they can to disabuse the client of this fallacy. In the case tried the client endeavoured to evade his liability, although the sketches were no doubt of value in inducing tenants to build. The employment of another architect to carry out a scheme, to some extent probably based on the drawings first prepared, is a course that has been often followed by scrupulous persons, and should serve as a warning to the profession to obtain a written agreement before employment whenever they are asked to do preliminary work of the kind we have mentioned. In the Schedule of the Institute, the preliminary sketches and conferences are included in the commission of 5 per cent.; but it by no means implies that the sketches do not include the first thought of the architect, nor that they should be given in as something of trivial importance; for Clause 5 expressly says that "preliminary sketches and interviews, when the drawings are not further proceeded with, are charged for according to the trouble involved and time expended." It would have been more satisfactory if a definite item had been made of this point.

THE ROYAL COMMISSION ON SEWAGE.

THE interim report of the Commissioners appointed in 1893 to inquire and report what methods of treating and disposing of sewage might be adopted has been issued this week as a Blue-book. The report is signed by Lord Idelcote, Lieutenant-Colonel C. Thipps

Carey, Mr. Charles P. Cotton, Sir Michael Foster, Lieutenant-Colonel T. W. Harcourt, Mr. F. W. Killick, Professor William Ramsay, Dr. J. B. Russell, and Mr. W. H. Power. The Commissioners were appointed to inquire and report:

I. (1) What method or methods of treating and disposing of sewage, including any liquid from any factory or manufacturing process, should properly be adopted, consistently with due regard for the requirements of the existing law, for the protection of public health, and for the economical and efficient discharge of the duties of local authorities; and (2) if more than one method may be so adopted, by what rules, in relation to the nature or volume of sewage, or the population to be served, or other varying circumstances or requirements, should the particular method of treatment and disposal to be adopted be determined; and

II. To make any recommendations which may be deemed desirable with reference to the treatment and disposal of sewage.

While many investigations remain to be completed, the Commissioners state:—

We have, however, arrived at conclusions on three questions which appear, for reasons hereafter given, to be of urgent importance, and we have therefore deemed it desirable to make a preliminary report and to publish the evidence already taken.

The three questions are:—(1) Are some sorts of land unsuitable for the purification of sewage? (2) Is it practically uniform to produce by artificial processes alone an effluent which shall not putrefy, and so create a nuisance in the stream into which it is discharged? (3) What means should be adopted for securing the better protection of our rivers?

The three conclusions at which they arrive on these questions are as follows:—

Conclusion 1.—We doubt if any land is entirely useless, but in the case of stiff clay and peat lands the power to purify sewage seems to depend on the depth of the top soil. There are, of course, numerous gradations in the depths of top soil which are variable in nature, and it is not easy to draw the line between lands which contain a sufficient depth to justify their use, and lands which do not. We are, however, forced to conclude that peat and stiff clay lands are generally unsuitable for the purification of sewage, that their use for this purpose is always attended with difficulty, and that where the depth of top soil is very small, say six inches or less, the area of such lands which would be required for efficient purification would in certain cases be so great as to render land treatment impracticable. Further information with regard to this point will be available when our investigation of land treatment is completed.

Conclusion 2.—After carefully considering, however, the whole of the evidence, together with the results of our own work, we are satisfied that it is practicable to produce by artificial processes alone an effluent from sewage, or from certain mixtures of sewage and trade refuse, such, for example, as are met with at Leeds and Manchester, effluents which will not putrefy, which would be classed as good according to ordinary chemical standards, and which might be discharged into a stream without fear of creating a nuisance. We think, therefore, that that there are cases in which the Local Government Board would be justified in modifying, under proper safeguards, the present rule as regards the application of sewage under the general rule as to land, that the safeguards should be as laid down at present, and indeed it will probably always be necessary that each case should be considered on its own merits.

Conclusion 3.—We consider it of the utmost importance that the simplest possible means should be provided for adequately protecting all our rivers, and we are of opinion that it will be desirable, probably for some time to come, that scientific experiments should be carried on in order to ascertain all the real dangers of pollution, against which they should be protected. In the present state of knowledge, and especially of bacteriology, it is difficult to estimate these dangers with any accuracy, and it seems quite possible that they should be either exaggerated or undervalued, according to the predisposition of those who have to deal with them. An authority, guided by medical considerations, might not unreasonably be inclined to insist on a degree of purity which may ultimately prove in certain cases to be uneconomical, while another authority, with its mind fixed upon economy, might shrink

from taking essential precautions. It is, perhaps, scarcely for us to say what arrangements should be made; but we are of opinion that the general protection of our rivers is a matter of such grave concern as to command the creation of a separate Commission, or a new department of the Local Government Board, which shall be a Supreme Rivers Authority, dealing with matters relating to rivers and their purification, and which, when appeal is made to them, shall have power to take action in cases where the local authorities have failed to do so.

BUILDERS' BENEVOLENT INSTITUTION.

THE 54th annual meeting of the Builders' Benevolent Institution was held on Thursday, July 18, at the offices, 35, Southampton-row, Bloomsbury, W.C. Mr. J. T. Bolding presided, supported by Messrs. C. Russell, E. V. New, Thos. Stirling, J. Stirling, jun., J. Carmichael, and other friends of the charity.

The secretary Major R. A. Bruton read the annual report, which stated that when the unprecedented pressure of the times upon all classes of society was remembered, and how the great charities of the Metropolis had suffered, it was a subject of congratulation that this institution had not been more seriously affected. At the same time the falling off had been chiefly in the annual subscriptions, which must always be the mainstay of the charity. It was, therefore, hoped that those gentlemen who already subscribed would use their influence with the many friends who had not done so. The Institution owed a debt of gratitude to the president, Mr. John Greenwood, C.C., for his efforts in making the annual dinner such a financial success. The committee had again been able to elect all the eligible candidates this year, and it was a source of thankfulness that the members seeking election had not been sufficiently numerous to entail the necessity of a contested election. It was, however, expected that the number of applicants would be greater in the future in consequence of Rule III., Section 1., altering the age of candidates from 60 to 55, having been sanctioned at the last general meeting. Only three deaths amongst the pensioners occurred during the year, all of whom were men; while five pensioners had been elected. The annual dinner would be held at the Carpenters' Hall on Thursday, Nov. 14 next, when Mr. James Carmichael, of Wandsworth, who had consented to be President, would be in the chair.

Mr. Thomas Stirling moved the adoption of the report and accounts, adding that so long as they were on the right side, and elected all the applicants, he believed the subscribers would be well satisfied.

Mr. New seconded the motion, which was unanimously agreed to.

Mr. C. Russell proposed a cordial vote of thanks to the retiring President, Mr. John Greenwood, for the valuable services rendered to the charity during his year of office. It must be a satisfaction to Mr. Greenwood to leave the Institution in a somewhat better position than when he took office, and he would move that he be requested to become a member of the committee. (Hear hear.)

Mr. T. Stirling seconded the motion, which was carried by acclamation.

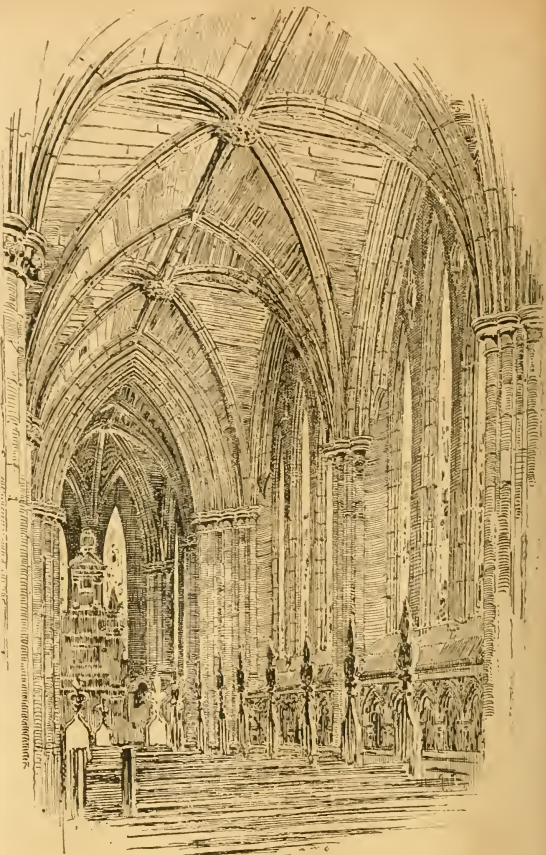
Votes of thanks were also passed to the vice-presidents, the trustees, and the treasurer Mr. J. Howard Gills; the committee; the retiring members being re-elected; and the hon. auditors (Messrs. J. T. Bolding and R. J. Ward).

The Chairman next proposed the election of Mr. James Carmichael as president, and congratulated the meeting on being able to get so well-known a man connected with the building trade to take the post.

Mr. Stirling seconded the resolution, which was agreed *unanimously*.

Mr. Carmichael replied, and announced his determination to do his utmost for the Institution. A vote of thanks to the chairman closed the proceedings.

Progress is being made with the conversion of the horse tramways at Newcastle-on-Tyne for electric traction and the extension of the system to the suburbs. At the last meeting of the city council it was reported that of the 2½ miles of track being laid down, the contractors have put down 19½, whilst 2½ miles are in course of construction. Altogether, however, there will be 41 miles of track to be laid down throughout the country.



The Third Period of the Vaulting.—The Choir Aisles.

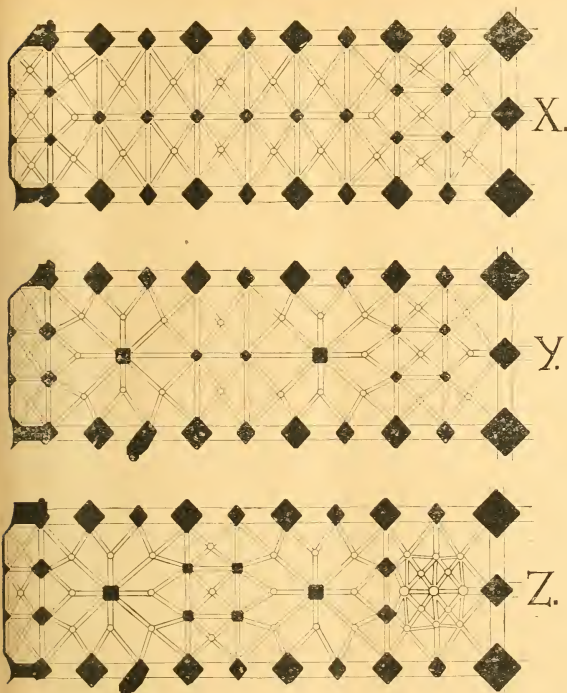
THE DOUBLE CHOIR, GLASGOW CATHEDRAL.*

[WITH ILLUSTRATIONS.]

THE architectural interest and archaeological charm associated with the Cathedral of Glasgow is well known. Its history, in so far as documentary record of the see is concerned, is lost in obscurity, as very little remains beyond the names of its Bishops for only a few such like facts have been preserved. The fabric itself constitutes really the only continuous chronicle of the building, which is inseparably associated with the progress of rib-vaulting, constituting, of course, the keynote of a somewhat intricate subject. Mr. Thomas Lennox Watson, F.R.I.B.A., has, with much discrimination and no little architectural knowledge, successfully endeavoured to trace the progress of this story as displayed by the vaulting of the two choirs, in which no fewer than five distinct periods may be observed, while each of these is separated from

the other by an appreciable interval of time, marked as the several series of vaults are by the development of later and newer types of ribs and mouldings, which are distinctly distinguishable as characteristic of different and succeeding schools of craftsmen. The middle vault of the lower church assumes so decided a contrast to the aisles, not only in detail, but in respect to its whole design, that the necessary inference is that it superseded another and radically different plan of the period of the aisles. The plan or general arrangement of a vault controls the conception of the whole structure, including its minor parts, and therefore it follows that when the main walls and piers of the crypt were set up, there must have been a plan of the vaulting of the whole of the choir. The middle compartment is, however, wholly the production of a later period, and so was ingeniously substituted for the initial one, the springers being replaced by new ones, or if retained considerably altered to adapt them to the new design. The darkness of the lower church probably accounts for these minor variations having generally escaped notice, and the modified springers and twisted ribs

* The Double Choir of Glasgow Cathedral, a study of Rib-vaulting. By THOMAS LENNOX WATSON, F.R.I.B.A. Glasgow: James Hedderwick and Sons, 1901.



occupy positions where there is least light. Mr. Watson read a paper on this vaulting in 1886 before the Glasgow Architectural Association, and the present volume is based largely upon the material, which he got together for the purposes of that lecture, amplified by further studies when he read a paper on the same subject before the Architectural Section of the Philosophical Society of Glasgow in 1895. The author has now endeavoured to complete the restoration of the original design of the middle vaulting. The sequence of the several stages of the vaulting has not received the attention at the hands of other writers which it deserved, though Sir Gilbert Scott referred to the subject as a "pretty and instructive puzzle." Mr. Watson's well-illustrated volume is partly devoted to the solution of this puzzle, as it is now understood. The three plans X, Y, Z show the three stages of the plan as the author assumes them to have been. At X we have the original plan of 1240, of which one bay was carried out. At Y appears the earlier of the plans of 1260, in which this bay was incorporated, and at Z the plan finally adopted is shown. The consequential changes thus arrived at are carefully discussed and described, amplified by photographs of the springs, and a general view as well as diagrams and plans of details. The drawings, which we have reproduced by permission, serve to enable our readers to see how well Mr. Watson has illustrated his remarks. The first period of the vaulting is seen in the south-west compartment of the lower church dating about 1220. The view in the lower aisles represents the second period of the vaulting, circa 1240, while the middle compartment, or the fourth period, is displayed in the next picture. This was followed by the fifth period of work, as seen in the vault over the transept stair, the date of which is uncertain, but not earlier, it seems, than

1270. The separate block depicts the third period of the vaulting, dated 1250, over the choir aisles. We have said enough to inspire a desire to become better acquainted with the history and development of this singularly interesting piece of pure architecture of the best period of Mediæval work. No better guide could be named than the volume under notice, and previous writers are therein put right and corrected, for the author has taken nothing second-hand, save the historical items already referred to, and which must be repeated. The publishers, Messrs. James Heddervick and Sons, of Glasgow, are to be congratulated on the artistic and workmanlike way in which Mr. Watson's labours have been supplemented by suitable binding, excellent paper, and capital printing. A series of measured drawings to a large scale are added to the volume by the pen of Mr. George S. Hill, A.R.I.B.A. Mr. John J. Joass and Mr. Alexander MacGibbon are also among the contributors. A photograph of the Cathedral, from an admirable photograph, forms the frontispiece. At the end of the book, diagrams in colour show an analysis of the mouldings, ribs, and vaults, thus making the study complete. It is a healthy sign that in these days of broken pediments and Rococo vagaries, when all sorts of extraneous influences are indulged in under the guise of "Free Classic," that so serious a volume of painstaking studies of Gothic design should be published, and we hope that the enterprise which the author and publishers have displayed will meet with the success it deserves, and serve, too, as a restraining influence over the wayward eclecticism of contemporary extravagance in architectural design.

Mr. R. W. Menmuir, assistant borough surveyor to the Ipswich Corporation, has been appointed municipal engineer of Woodstock, Cape Colony.

HOW TO ESTIMATE: OR, THE ANALYSIS OF BUILDERS' PRICES.—XVI.

By JOHN T. REA, F.S.I., Surveyor, War Dept.

ANALYSIS: ASPHALTE PAVING.

Cluridge's Asphalt (otherwise known as Pyrimont Seyssel asphalt).—For most work it is necessary to add a certain proportion of grit (or very small stones) and mineral tar to the natural asphalt, which is then heated and run into moulds, 18in. by 18in. by 6in. deep, forming blocks weighing 125lb. each. When about to be used these blocks are broken up into small pieces and melted in a cauldron, 1lb. of mineral tar being added for fluxing every cwt. of asphalt (2lb. of mineral tar having first been put in).

The cauldrons or pots used by the Seyssel Asphalt Company hold 5cwt. of asphalt each, and require to melt this about 1½cwt. of coal as fuel. Two spreaders, 2 attendants, and 1 cauldron man will work 2 pots and empty the three times a day, equivalent to 6 pots in all, the fires being lighted at 4 a.m., so as to be ready for the spreaders at 6 a.m.

A pot of asphalt will cover 70ft. super. at ½in. thick. The analysis would therefore appear:—

1 pot, or 5cwt. of asphalt at 7s. 6d. s. d.	
per cwt.	57 6
7lb. (2lb. + 5lb.) ½cwt. mineral tar at	
20s. per cwt.	1 3
1½cwt. of fuel at 1s. 6d. per cwt.	2 3
Grit for laying at 1s. 6d. per cwt.	0 6

Cost of materials per pot	s. d.
2 spreaders per day, at 7s. each	14 0
2 attendants " 5s. "	10 0
1 cauldron man " 5s. "	5 0
2 hours extra time of ditto between 4 and 6 a.m.	1 0

Labour working 6 pots	6 30 0
Labour working 1 pot	5 0

Total cost of 1 pot covering 70ft. super.	5 16 6
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Cost of 1ft. super.	0 8
Add 10 per cent. profit, say	0 1

Total cost per foot super.	0 9
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The above price would be for large quantities at contract rates, and a higher profit than 10 per cent. (which might be considered too low) would bring the cost up to that shown on previous page.

Sand and grit of different sizes are required to finish surfaces, and the asphalt should be free from admixture with coal, pitch, or any other combustible substance than mineral tar.

GRANITE PAVING.

A pavior (3d.) and labourer (6d.) will lay, including graveling the bed and gouting, granite sets 5in. deep and under, 11 yards super. per day of 10 hours (3d. + 6d. = 1s. 3d. × 10 hours = 12s. 6d. = 11 1s. 12d. per y.s.).

Ditto sets 5in. to 7in. 10 yards super.	1s. 3d. per y.s.
Ditto sets 7in. to 9in. 9 yards super.	1s. 3d. per y.s.

3in. by 7in. deep Granite Sets, and laid complete in Parallel Courses.—1 ton of these sets would cover about 3 square yards; therefore 1 ton covers 1 square yard.

1 ton granite sets at 28s. per ton at wharf	8 4
1 ton for landing ditto at 6d.	0 2
1 load cartage at 1s. per load of 1½ tons within 4 miles radius of wharf	1 0
1 yd. cube of coarse-screned gravel at 3s. 3d.	9 4
Labour for foregoing, 12s. 6d. + 10 s.	1 3

Add 10 per cent. profit	12 1
Cost per yard super.	13 4

PEBBLE PAVING.

One ton of pebbles will cover from 4 to 6 square yards, according to size and mode of laying. Assume, however, that 1 ton of 3in. pebbles laid flat, and evenly, in gravel will cover 6 square yards, or ⅔ ton to the yard super. A pavior and labourer will lay 20 yards a day, or half an hour for each yard. Add gravel, and for labour forming ground.

Labour forming ground	s. d.
1 ton of 3in. pebbles at 12s. 6d. per ton	0 2
Gravel for bedding, 1 yd. cube at 3s. 3d.	2 7
Labour laying, 1 hour pavior (3d.) and labourer (6d.) at 1s. 3d.	9 4

Add 10 per cent. profit	3 4
Cost per yard super.	0 4 4

WOOD-BLOCK PAVING.

Wood Paving of 9in. by 3in. by 6in. Red Deal Blocks, grouted with Cement, and laid on 6in. concrete, — Blocks of this—the commonest—size cost £6 10s.

the most dangerous water flowing from a drainage area. Unless flood-water courses be provided, separation is impossible. Moreover, if flood-water is allowed to enter a reservoir at the head of the works, it has a tendency to drive the clean water over the waste weir. Of course, land drains connected with dwelling-houses and farm buildings should not be allowed to discharge into the reservoir of a reservoir; and when the physical features of the land do not admit of a system of drainage being carried out, intercepting wells or cesspits should be constructed, so as to arrest the sewage, which should thence be conveyed to the open air, or to be spread on permeable substrata, where it would be effectually filtered and rendered harmless. The safest plan, however, is to purchase the drainage area, and remove all possible sources of contamination. Some reservoirs are, in a measure, protected by the reservation of a narrow strip of land between the top-water level and any adjacent fields likely to be manured. Manure so placed upon land is, however, liable to be washed off, and so got into the reservoir during heavy rain, especially in frosty weather, and where the water is exposed to the sun. Attention should also be given to the land drains discharging into the streams which feed the reservoir, which naturally occupies the lowest position in the valley. Water plants should not be allowed to grow in the shallow margins of a reservoir, and constant weeding is necessary in the spring of the year to keep them down. To prevent and to further check their growth the sides should be pitched with stone, and the water drawn down as frequently as possible, in order to destroy the roots as well as any ova deposited thereon, and the vegetation and stone pitching. The shallow of a reservoir afford suitable spawning ground for frogs, which, with the opening of spring, appear in great numbers, and render the appearance of the water very offensive. This spawn should be collected as soon as it appears, and be buried in lime and soil some distance away from the reservoir, or in a deep water, or running stream. Fish should not be allowed to multiply too freely, and care should be taken to exclude all but the cleaner kinds, of which *Salmo* (river trout) are the best; but unless they have a running stream in which to spawn, they will multiply so much, and grow so fast, that too long in deep water, they grow lank and sometimes become blind. *Fario* will not live long either in a reservoir set apart for the storage of flood water, or of water selected in the manner suggested, as the food supplies are intermittent. Fish, so simply as to be secured, and their presence in reservoirs is beneficial, but they do not otherwise purify the water. They, no doubt, devour the ova and larvae, and many forms of life which exist in water, and the objectionable *Ignace* (the shelled river snail), found in some reservoirs, are reduced by them, and it is also alleged that fish destroy the *cyclops*, but the evidence on this point is not well authenticated. In the author's opinion, these crustaceans are too small for fish to notice as food unless their powers of sight are exceptional: these *cyclops*, moreover, devour manna, and probably other minute insects to the water than the fish, as they feed on the minute organisms which are known to carry infection to the consumers. On the other hand, it may be, generally speaking, taken for granted that the fewer the forms of life in water the purer is the water, and that, if it is, therefore, more wholesome is an open question. Trees, although objects of beauty in a landscape, are not always desirable. They prevent evaporation and a free flow of water off the land, and consequently springs are more abundant where they are absent. They should not, however, be allowed to remain where falling leaves cover their way into drinking water—in fact, vegetable matter of every kind should be kept out of streams and reservoirs used for domestic supplies. Such vegetable matter may not be actually unwholesome in itself, but here it provides food and shelter for aquatic life which is objectionable, it is better kept out of the water. The sources of pollution hitherto referred to may be prevented either by the purchase of the gathering ground, by the proper construction and arrangement of the works, or by good management; but pollution is sometimes found to exist on a watershed which it is not easy to detect or remove, such as that occasioned by denuding agencies, and the erosion of the exposed surface of the land, by the solvent power of the water, by objectionable

mineral springs, the decay of vegetation, road washings, and matter from dwellings, which should be well removed. By purchasing the drainage area, some of these sources of contamination may be removed, and others rendered less injurious; but pollution of some kind will nearly always exist, in spite of every reasonable precaution. The purity of moorland water is, however, very much improved by the straining from which it is derived or conveyed to the reservoirs, and to prevent disintegration the main feeders should be pitched with rubble stone, and the adjacent springs and swampy ground be drained direct into them. Water from pit beds is also very much improved by straining, especially when the higher areas from which most of the water is derived. A few leading drains will suffice if opened out and carried deep enough in the right direction. Where stone is not available, open cuttings answer very well; but in a spongy subsoil the sides require support and protection. Intercepting or wreck lodges placed across a stream will arrest coarse *debris*, and prevent much siltling up of the reservoir. These require cleaning out from time to time when dry weather permits. All that is required is a strong rubble stone wall, with a draw-off pipe at the top, and a by-pass to be used while the cleaning out is in progress: they need not be watertight, or deeper than from 6ft. to 9ft., but the level of the streams will in all cases determine the depth. The author has made many with complete success, and can testify to their value. The collecting and storing of a town's water supply should be carefully attended to at its very source, whether it be afterwards filtered or not. The streams, drains, and springs are too often neglected, and because of their distance away only being visited from time to time. Floods sucking up the ground, deep roots and branches of trees, bracken and tufts of hay, all of which are liable to block up the stream in narrow places. To guard against this, the principal feeders should be examined directly after a flood, and every obnoxious thing removed. In nitifying the water, the action upon lead of certain waters, several methods for preventing this have been suggested, but no effective plan has, so far, been introduced whereby the acidity of the water is entirely removed so as to satisfy engineers and chemists. Lead is so apt to be itself injured, and is injurious to health; but the acid it contains acts powerfully upon lead, and may dissolve sufficient to cause lead-poisoning. The remedy which finds most favour with engineers is to pass the water through a layer of chalk or limestone chippings, placed among the coarser material of the filters below the sand. Soft water when brought into contact with limestone liberates carbonic-acid gas, and causes a deposit of carbonate of lime to form on the surface of the lead, which prevents any further solvent action taking place. The cost of this coating is not small, and it permanently resists the action for all time it is impossible to say, and it is obvious that if this coating goes on accumulating, the pipes must become seriously reduced in size. There is a need for a metallic service pipe which, both in ductility and in strength, could have, in addition, the power of resisting the solvent action of water charged with peaty and other acids. New piping is more readily acted upon than old, and probably a baser metal than lead—if one can be discovered—is all that is required. In recent years iron piping has been used, but it is not perfect, and there is no reason why it should not be even more extensively used, as there is no doubt but that lead pipes and disterns are dangerous to health when used in the storage or conveyance of soft water. The time has arrived when span yarn should cease to be used in making the joints of socket pipes, and old lead rings substituted. The fibre of the yarn is vegetable material, and in the course of time decays and pollutes the water. Some engineers have dispensed with it, and I see no reason why others should not do likewise. The use of lead joint, and the little more than a yarn and lead joint, and the surface of lead brought in contact with the water can be reduced to a minimum. It has occurred to the author that these cold lead rings could be forced in by hydraulic power,

and thus save the expense of firing, making joint holes, and setting-up, in the case of molten lead joints; the socket should be shortened, and the amount of lead required reduced. The standardising of pipe sockets, too, is a thing greatly needed, and which would simplify and probably cheapen the manufacture of pipes generally. No water supply from such sources as have been indicated can be considered as sufficiently pure for domestic use unless it is filtered immediately before it passes into the supply mains, for while it may be potable and wholesome without other filtration, yet arrangements exist for effective denudation, yet *cyclops*, and other forms of life are liable to go with the water into the mains, and thus find their way to the consumers. Screening the water through fine gauze is sometimes substituted for filtration, but it is neither satisfactory nor so effective as the latter. The deposition of sediment in the supply mains is also a common cause of complaint, and is intensified every time the water is turned off. Even in the best supplies of filtered water, fine sediment will accumulate in the pipes, and is not all due to the matter in suspension in the water, but partially to peroxide of iron from the metal of the pipes, and is deposited in the form of barnacles, especially when the water is often withdrawn or air gets to them. To remove this, more frequent flushing of the mains is required, the velocity of the water being such as to give an effective scour in the pipes. The districts of supply should not be too large, and, although they might be supplied from one common source, each should work independently. Dead ends should not be allowed, complete circulation of the water should be insured, as it is not improved by being kept too long in the mains, whereby the benefit of oxygenation is lost.

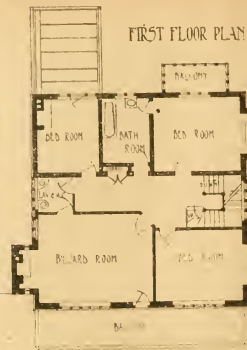
AN ARCHITECTURAL DICTIONARY.*

MESSRS. MACMILLAN have brought out the second volume of their new Anglo-American Dictionary of Architecture and Building, thus bringing the nomenclature of the subject down to the letter N. We have already noticed the first volume, and the instalment of the work before us certainly realises the anticipations expressed by a perusal of the initial part. The Editor remarks in the preface that a good dictionary makes good reading, and if a column or a page be read cursorily, it will be still better reading if the reader is in the mood to take a little pains, and turns to one article after another, following not the alphabetical sequence of the terms, but the sequence of his own thought. The history of the subject can thus be traced and worked out, and provided that care has been taken by the Editor to insure a connective link between the several articles appearing in the volume by various and, in some cases very differing, contributors. The latter have been chosen chiefly with regard to their special acquaintance or acquired sympathies with some given subject; but this necessarily eclectic system of selection tends rather to a diversity of treatment always more or less an essential characteristic of all encyclopedias. The book under notice contains some of the more important mechanical and scientific subjects, as Floor, Foundation, Frame and Framing, Iron Construction, Masonry, and Mortar. The volume, too, is rich in fairly written articles of the guidebook type, treated, however, specially from the architect's standpoint with more than ordinary thoroughness. In this way we have descriptions of France, Germany, Greece, Japan, and North Africa, contributed in each case by writers who possess personal knowledge of the places referred to. India is not overlooked, for Professor Hamilton, of Columbia University, has given a full epitome of the history of architecture in that vast peninsula, dividing, for the sake of conciseness, the natural record of architectural art as associated with its religious origin and purposes, the Buddhist, the Jaina, the Brahmin, and the Mohammedan or Indo-Aryan religions, given again have their subdivisions more or less of relative importance. Modern buildings in India are referred to very briefly, and contemporary Hindu architects are described as possessing

* A Dictionary of Architecture and Building, Biographical, Historical, and Descriptive. By Russell Streats, A.M., Ph.D., Fellow of the American Academy of Architects. In two Volumes. Vol. II. N. New York and London: Macmillan and Co., 1901. F. N. Y. 25s. net.



GROUND PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

BOOKS RECEIVED.

MISS NINA FRANCIS LAYARD has written *A Brief Sketch of the History of Ipswich School*, which has been published in pamphlet form, with numerous illustrations, by W. E. Harrison, of The Ancient House, Ipswich. The authoress has collected for the first time and arranged the scattered notices relating to the early history of this ancient and flourishing grammar-school, which is about to celebrate the jubilee of its present premises on Henley-road, of which the foundation-stone was laid by the late Prince Consort in 1851. The earliest reference to the school is in 1477, being only thirteen in age among the greater schools by Winchester 1382 and Eton (1440), while Rugby and Harrow are nearly a century younger. A fresh charter was granted to Ipswich School by Queen Elizabeth in 1566, and was deemed of such importance that the institute is commonly entitled Queen Elizabeth's School; but Miss Layard shows, by reference to Nicholas Bacon's Annals and other documents, that the foundation came far truer back than such a title would imply, by a charter of Henry VIII. to the 17th year of Edward IV. It was then held at the chapel of Black Friars' College, and having been removed in 1528 by Cardinal Wolsey to his College in St. Peter's, returned to the Friary in 1583, where it remained till 1763. A letter from John Foxe, the Martyrologist, to the Lord Chief Justice, recommending John Smythe, a native of the town of Ipswich, is quoted as "a worthy, golly, and learned scholarmaster." The apocryphal was apparently successful, as the nominee was master from 1580 to 1585. An appendix gives the names of the masters and ushers from 1487 to the present day. The pamphlet is well printed, and is illustrated with a dozen full-page engravings, a conjectural restoration of the Black Friars' Monastery forming the frontispiece.

Sanction has been received by the town council of Bury St. Edmunds to the borrowing of £11,313 for electric supply purposes.

The Barton Town Council, at their last meeting, adopted a report by a special committee on the new corporation fire brigade and depot, the erection of which they estimated to cost £1,250. Another public improvement was also agreed to, viz., the acquisition of the iron foundry fronting Station-street, the main thoroughfare from the railway station, and belonging to Messrs. Briggs and Co., the intention being to either pull down or reconstruct the property on other lines and set it back.

Mr. Arnold Royle, C.B., an inspector of the Local Government Board, recently held an inquiry at the town-hall, Huxley, in reference to the application of the Huxley, Stoke, and Fenton Joint Hospital Board for permission to borrow £2,000 for the purposes of the infectious diseases hospital. The clerk said it was proposed to provide covered ways connecting the administrative block of the hospital with the various wards. They had invited tenders, and had provisionally accepted that of Mr. J. Bagnall, of Fenton, the amount being £1,855, the remaining £145 being required for architect's commission, solicitor's charges, and contingencies.

capabilities of no mean order. The buildings of the late Mr. Stevens, of President Emerson, Sir Gilbert Scott, and others are not so much as mentioned. Ireland is not overlooked, though its historic buildings are only referred to in a subject up-to-date, the last dated building noticed being the Doric-pillared porch of the General Post Office, Dublin, 1815. Street's rebuilding of Christ Church Cathedral is not referred to, not to mention other modern works of more than local importance. The article on "House: a Dwelling," developed from the hut and wigwam to the tenement house and the palace, is so comprehensive as to be well-nigh beyond the limits of any contributor's available space in any sort of ordinary dictionary. The present paper by the editor seems, however, somewhat inadequate by itself, and so we suppose the subtitle "County House, County Seat, and Chateau" must be taken in conjunction with it. The illustrations, which accompany the text are reproductions from Viollet-le-Duc and others more or less familiar, of the Hotel de Cligny and Jacques Coeur's house at Bourges, a Swiss timber chalet, a Gothic front from St. Yrioux, a plan of the Insula at Pompeii with the house of Pansa, a Syrian house at Moabitein, and, as compared as a type for reference with the modern plan at Cordova, with its patio, the universal feature found in the Mediterranean. The immediate connection of the cuts is not always quite evident, and sometimes no reference to them appears in the text. The subject of "House-drainage" follows the last, from the pen of a W. P. Gerhard, who gives some useful information, though his treatment of the question hardly accords with the details of our English method of judging by the section. The traps and connections are all exposed in the cellar, and presumably are all in iron through the house, as they should be, doing away with inspection chambers; but the trunk or cellar in which they occur should at least have a thorough way current of air. Mr. W. Rich Hatton, M.M. Inst. C.E., London, of New York, writes the article on "Iron Construction," giving details of the so-called "skeleton buildings," and some account of the history of framework buildings in iron. The section of the church of St. Augustine in Paris, erected in 1872, is particularly interesting, whatever may be thought of its architectural merit. The Paris Exhibition buildings, erected at the end of the last century, are described, and some further particulars of the method of building the modern skyscrapers in New York would have brought the subject up-to-date. The photographic views throughout the dictionary are useful, and they are reliable; but we should have thought it would have been worth while in an undertaking of such wide interest and permanent utility to have had more specially prepared illustrations from drawings by some contemporary architectural artists and draughtsmen. The best illustrations included in the work are reproductions from Nesfield or Norman Shaw, Viollet-le-Duc or Street, compiled from works no

doubt of the first merit, but a little out of accord with modern process facilities for book illustration. If this is true of these, what shall be said of reprinting illustrations from Parker's works, such as the woodcuts of Oakham Castle, Rutlandshire? No one who knows the building would recognise it from such old-fashioned representations as those on page 352, under the article of "Hall," and the same remark applies to the famous castle at Skoksey, Shropshire. It would have been far better to have reproduced some of the drawings of this delightful old mansion which have appeared in our own pages during the past ten years. As a matter of fact, the English professional journals give a vast amount of architectural drawings which furnish an unequalled store of reliable detail, which the compilers of a dictionary of this kind are very unwise to ignore, seeing that from no other source is so comprehensive an assemblage of excellent studies to be obtained, and that for the trouble of seeking. The material is there, but it has necessarily to be looked up. It, no doubt, is easier to buy a few familiar standard works and cut out the illustrations as they may best work in, writing up to the drawings as they best may fit, or furnish the article.

THE OBSERVATORY, WESTGATE-ON-SEA.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

THIS house is situated in a picturesque position, looking out over Westgate Bay, and commands extensive views. By reference to the plans it will be seen that there is on the ground floor a hall-storing-room divided by stone columns from the passages. This room is lined to a height of 7 ft. 6 in. with paneling in stonework, and the joists are exposed, being stained a dark colour. In addition there is a drawing-room and dining-room, all three rooms having inglenooks with windows, in order that full advantage of fine views may be obtained. The first floor contains bedrooms, billiard-room, lavatory and bathroom, and the top floor has several bedrooms. The building is constructed of brick with tile hanging, and the chimney-breasts are rough-cast externally. The roofs are covered with sand-faced tiles, the circular dormer window being covered with copper. The feature which gives its name to the house is formed at the summit of the main roof and forms a belvedere or observatory from which excellent sea views can be obtained. The works have been carried out by Messrs. Flint & Sons, of London, from the designs and under the superintendence of the architects, Messrs. Kimster Fletcher and Sons, of London.

A new isolation hospital has recently been erected at Gt. Wymondley, near Leicester, from the designs of Messrs. Blackwell and Thompson, of Leicester. Accommodation is provided for 160 patients, made up as follows:—Four separate one-story scarlet fever pavilions of 20 beds each, one similar pavilion with 28 beds for typhoid fever; one two-story isolation and quarantine block for 28 beds. The outlay has been about £30,000.

OBITUARY.

MR. ROGER LOFTHOUS, F.S.I., head of the firm of Messrs. R. Lofthouse and Sons, architects, of Albert-road, Middlesbrough, died at his residence, The Croft, Linthorpe, recently, aged 55 years. Mr. Lofthouse was a native of Wensleydale, and having spent some years with a local firm of architects and builders, commenced business in Middlesbrough as a partner of the firm since an architect. He was an ecclesiastical surveyor for the diocese of York, and a valuer under the Finance Act to the Middlesbrough County Council. He was an ex-president of the Cleveland Naturalists' Field Club, of which he was one of the original members of the Yorkshire Architectural Society. Mr. Lofthouse painted in oils, did much etching and lithographic work, and made a series of drawings for the late Canon Atkinson's "History of Cleveland." In 1893 and 1897 he took his sons, Mr. T. A. Lofthouse and Mr. J. A. Lofthouse, both Associates of the Royal Institute of British Architects, into partnership with him.

MR. NAPOLEON L. BRY, who died in New York on July 9, was born in Philadelphia in 1821, where he was educated professionally in the office of Mr. T. H. Walter, the architect of Girard College. During his residence in Philadelphia he designed the Cathedral and other churches of the city of Music. In 1864 he moved to New York and designed the Epiphany Church, the Masonic Temple, the Foundling Asylum, and numerous other buildings, and, in partnership with his sons, the office buildings of the Home Insurance Company and the Metropolitan Life Insurance Company and other well-known structures in that city.

MR. ROBERT BAYLY, timber merchant, Plymouth, died on Thursday evening in last week at his residence, Torr-grove, in that town. He was the eldest son of the late Mr. John Bayly, timber merchant of Plymouth. He was born on June 11, 1839, and after finishing his studies in France, he joined his father, who was managing a business that had been established at Plymouth very early in the 18th century. In January, 1876, he became sole proprietor of the undertaking, his father having retired after being connected with the firm for fifty years. When Mr. Robert Bayly took over the management, he at once extended his field of operations, and branches were established at Orston, Bristol, and elsewhere, a large number of workmen being employed by him. The business soon became one of the most flourishing concerns of its kind in the United Kingdom. Mr. Bayly was a moving spirit in the Plymouth Gas Company, a director of the Devonport Waterworks Company, a member of the Cattlewater Commissioners, and a member of the Station Harbour Improvement Company, of which undertaking he was for many years the chairman. During his tenure of office great improvements were made in the property, the principal ones being probably the deepening of the estuary, the erection of new fish markets, and the making of the new quay at Cossile Creek. Mr. Bayly was one of the chief movers in the building of the Batten Breakwater. In 1893 he was President of the Plymouth Chamber of Commerce, and in that year the Associated Chambers held their annual meetings in Plymouth.

The first granite ever sent from the United States to England was shipped to Scotland last month from Stonington, Maine. The American Granite Companies say they can sell Maine granite in Glasgow, Aberdeen, or Liverpool at 4s. per foot, whereas Scotch granite costs about 5s.

The Board of Trade have recently considered the undermentioned Light Railway Orders: (1) Blackpool and Garstang Light Railway Order, 1901, authorising the construction of a light railway from Blackpool to Garstang; (2) Barrowford Light Railway Order, 1901, authorising the construction of a light railway in the urban district of Barrowford, Lancashire; (3) Nelson Light Railways Order, 1901, authorising the construction of light railways in the borough of Nelson; (4) Colne and Trawden Light Railways Order, 1901, authorising the construction of light railways in the county of Essex, between Chipping Ongar station, on the Great Eastern Railway, and Great Bardfield; (5) Pewsey and Salisbury Light Railway (Extension of Time) Order, 1901, amending the Great Western Railway (Pewsey and Salisbury) Light Railway Order, 1898, and the Pewsey and Salisbury (Devizes Branch) Light Railway Order, 1898.

PROFESSIONAL AND TRADE SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—On Saturday afternoon last, through the kindness of the Earl of Mount Edgumbe, the members of the above society visited Cotehele House, on the banks of Tamar. A large gathering of Plymouth architects assembled at Bardonston, and there met their long contingent, and from thence proceeded to this charming old seat. Amongst those present were Mr. Henry George Luff, A.R.I.B.A., president of the parent society; Mr. Charles King, F.R.I.B.A., chairman of the Three Towns Branch; C. Cole, John M. Pimm, V.P., Harbottle Reed, hon. secretary; W. Lister, M. A. Sackley, A. C. Mans, A. Heath, J. Keats, C. Cheverton, A. J. Pinn, Harold Watts, S. C. Griffin, A. N. Tucker, W. W. Hitchens, and B. Priestley Shires. Upon arrival at Cotehele the party were shown over the house, and examined the various features of great interest, including the interesting hall, with its examples of burnished armour, the chapel, and the various other apartments of this relic of Edwardian times. Subsequently, upon the return to Calstock, the whole of the members were entertained to high tea at the Passage House Inn by Mr. Charles King.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of the council of this association, Mr. Henry F. Kerr, A.R.I.B.A., president, in the chair, the immediately impending demolition of the Ionic portico to Parliament-square was under consideration. This portico was designed nearly a century ago by Elliott, and is in great part, a transcript of the famous portico of the Erechtheum at Athens. It is regarded as a fine work, and of commanding scale, and as an example of the Ionic order in its richest development is of great importance. The base and the entablature have original features of individual interest and value. Perhaps the excellence of its design and the beauty of its material and masonry would have been more generally appreciated had it faced another aspect than the east, where the due effect of light and shade from the sunlight can only be fully appreciated in the early morning. The president of the Association, fully acknowledging the merit of this piece of architecture—one of the very few remaining works of such scale and excellence—unanimously resolved to express its deep regret at the possibility of its being lost to the city of Edinburgh, and its earnest desire that the way it may yet be saved. Assuming that the portico cannot be retained in its present position, the council is of opinion that within the confines of the municipality a place and a use could be found for it, so that it may continue to be an ornament to the city. The council is strongly of opinion that the destruction of this noble portico would be not only a civic, but to a great degree a national loss, and in this age of conservatism for all things worthy of repute it would be an irretrievable disgrace if the stones were allowed to be broken up.

WOLVERHAMPTON AND DISTRICT ARCHITECTURAL ASSOCIATION.—Under this title the architects of South Staffordshire have banded themselves together into a society. Mr. Joseph Lavender, F.R.I.B.A., of Gresham Chambers, Wolverhampton, has been appointed the first president; Mr. G. H. Stanger, F.R.I.B.A., of the same town, vice-president; and Messrs. J. H. T. H. Florening, and H. E. H. Eachus members of council. The hon. treasurer is Mr. J. Harrison Weller, the hon. secretary Mr. W. Edwards, 25, Darlington-street, Wolverhampton; and Mr. W. J. Oliver, M.S.A., the auditor. The membership is divided into three classes—members, associates, and hon. members—the subscriptions being 15s. for members and half-a-guinea for associates, with an entrance fee of one guinea in each case. No member is to be elected to the office of president or vice-president two years in succession. The meetings hitherto have been of a strictly business character. The first ordinary meeting was held on Thursday in last week, the 18th inst.; the second will be held on Thursday, October 17, and the annual general meeting is convened for Thursday, January 16, 1902, when the presidential address will be delivered by Mr. Lavender.

At West Hartlepool, on Friday, the foundation-stone of the new infants' school for St. Andrew's parish, Loughill, was laid by the Venerable Archdeacon of Auckland. The new school will cost £1,500, and will accommodate 176 infants.

COMPETITIONS.

GLASGOW.—At the last meeting of the corporation a discussion took place on a proposal of the city improvements committee regarding a plot of 15 acres of ground adjoining Alexandra Park, belonging to the corporation. The committee recommended as an experiment that the portion of said area bounded by Cumberland-road on the south-east, by the Glasgow railway on the west, and other portions of the lands of Kennedy on the north, be laid out for the erection thereon of buildings containing dwelling-houses of one apartment, two apartments, and three apartments respectively, in the following proportions—viz., 30 one-apartment houses, 40 two-apartment houses, and 30 three-apartment houses, with a certain number of shops in the building sufficient for the requirements of the tenants; the houses to be let at rents varying from £5 to £12 or £13 per annum; the buildings not to exceed three stories in height, and the streets to be formed through the ground to be not less than 50 ft. wide. The committee further recommended that competitive designs be asked from outside architects for the purpose of covering the ground referred to with buildings of the proportion indicated. The report was eventually adopted.

HEREFORD.—Forty-six designs were sent in by architects for the proposed new municipal buildings at Hereford, and the assessor, Mr. Thomas Blashill, F.R.I.B.A., London, gave his awards as follows:—(1) £100, Messrs. Macintosh and Newman, High Holborn, London, W.C.; (2) £75, Mr. H. F. Fowler, Barrington-Furness, 3, 450, Messrs. Stanger and Stanger, West Strand, London. The following were reserved by the committee:—Messrs. Brookes and Son and Godsell, Hereford; Messrs. W. J. Morley and Son, Bradford; and Mr. H. A. Cheers, Twickenham. At a special meeting of the building committee of the corporation on Saturday the designs of Mr. H. A. Cheers were accepted. The cost of the new building will be close upon £20,000.

ROCHDALE.—At the last meeting of the building committee of the Rochdale School Board, competitive designs for the new Central Schools were submitted by Messrs. Andrews and Butterworth, of Manchester; Messrs. Butterworth and Duncan, of Rochdale; and Messrs. Stanger and Stanger, of Hereford. After considering the designs, the committee recommended the Board to appoint Messrs. Butterworth and Duncan as architects for the new schools.

SHEFFIELD.—The Sheffield School Board received at the last meeting a recommendation from the Building Committee, who stated that the seven sets of competitive plans for the proposed school at Rannoch had been submitted to the assessor, Mr. E. R. Robson, F.S.A., of London, and in concordance with his report they proposed "that the plans submitted by Messrs. Holmes and Watson be accepted and adopted for the above-named school, subject to the conditions set forth in the instructions for the guidance of architects and to any modifications which may be deemed necessary, subject also to the approval of the Board of Education. That premiums of £15 each be awarded to Mr. H. I. Potter and Messrs. Hemmell and Watson, who have respectively placed the second and third in order of merit." The recommendations were adopted. At the same meeting plans submitted by Messrs. Holmes and Watson for the erection of a semi mixed department in connection with Tinsley Park-road school, to accommodate 750 children, were adopted.

The St. Olave's Guardians have obtained the Local Government Board's final approval of the plans of the cottage homes which they propose to erect at Shirley at a cost of £148,000. Messrs. Newman and Newman, of Tooley-street, S.E., are the architects.

At Tonbridge a new water gate at the entrance to the Castle leading from the High-street to the riverside promenade was thrown open last week. It was built from designs by Mr. W. L. Brophy, surveyor to the corporation, and is a fine specimen of rough-dressed local sandstone with hammer and iron gages.

A faculty has been granted by the Chancellor of London diocese for the alterations in contemplation at St. Giles, Cripplegate, London, which are the remodelled St. Bartholomew's, Moor-lane, in place of pictures upon the walls; the removal of the Ten Commandments to the west end of the church, and the erection of a porch.

Building Intelligence.

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BURTON.—A municipal lodging-house is about to be built by the Bristol Corporation at the corner of Wade-street and River-street, St. Philip's. The building, designed to accommodate 120 beds, will be of a thoroughly plainly treated, while the only freestone ornamentation being at the main entrance at the angle formed by the junction of the two streets. It will consist of basement and four floors, and the roof will be of Bridgewater (that is, the clear height from floor to ceiling on each floor will be 10 ft. 6 in., except the basement, which is 10 ft. 6 in. The plans have been prepared under the supervision of Mr. T. H. Yabicom, the city engineer, and special attention has been paid to ventilation and sanitary requirements generally. The basement will contain a series of lockers for the use of the lodgers, a laundry, a large lavatory, linen store, baths, boiler-house, and other offices. The ground floor will comprise entrance-lobby, vestibule, and corridor leading to a reading-room, 27 ft. 6 in. by 14 ft. 6 in., beyond which will be situated the dining-hall, the average size of which is 53 ft. 6 in. by 23 ft. On the right of the hall will be the main staircase, of Pennant stone, leading to the floor above. There will be a lodger's kitchen, 31 ft. by 10 ft., in which the lodgers will do their own cooking, for which purpose two ranges will be provided, and an arrangement will also include wash-up sinks and other requisite, while at the rear of the building there will be an open paved yard. The residence of the superintendent will lie on the ground floor, and this will be provided with a separate entrance. The main entrance is fitted with turnstiles, and will be necessary for the lodger to obtain a ticket at the office before he is allowed to pass into the building. On the first, second, and third floors the accommodation in each will consist of about 40 cubicles, 8 ft. by 5 ft., approached by corridors, 4 ft. 6 in. in width. Each cubicle will have a separate door, a window, and several small built-in cupboards. The estimated cost of building, including site, but exclusive of furniture, is £7,100.

GILROSE, LEICESTER.—At Gilrose, near Leicester, an area of about 42 acres is to be laid out as a new cemetery. Part of the work is at present in progress, including the laying-out of about 23 acres of the area, and the erection of the necessary buildings. A large area of 10 acres is to be laid out, having a width of 20 ft., the width of the subsidiary paths being 10 ft. and 8 ft. The scheme provides accommodation for about 42,000 graves. The work is being carried out from the competitive designs of Mr. Catlow, of Leicester. The buildings include two chapels, connected by a tower and cloisters, with vestry, sexton's and public waiting-rooms, Bier-shed, mortuary, embalmers' waiting-room, ladies' and gentlemen's lavatories, and urinals. At the back of one of the chapels a crematorium is to be provided. The surface drainage is conducted to an adjoining brook, and the drainage from the sanitary fittings and graves is conducted to a chamber containing a Shone's ejector, which passes it on to the sewage-farm direct.

HAMMERSMITH.—Towards the close of 1880 Sir Edward C. Guinness, now Lord Iveagh, placed in the hands of trustees £250,000 for the purpose of providing, at low rents, dwellings for the more necessitous classes who were crowded out of the £200,000 was to be expended in London and £50,000 in Dublin. During the subsequent twelve years the Guinness Trust has (independently of its Dublin work) erected eight large groups of dwellings, which will, when the eighth is completely tenanted, house 2,517 families upon eight freehold sites in the most populous districts of London at a total outlay of over £450,000. The greater part of the eighth group of buildings, situate in Fulham Palace-road, Hammersmith, was opened on Wednesday last. These buildings, erected from the designs of Messrs. N. S. Joseph, Son, and Smith, comprise four blocks of dwellings, to which three smaller ones are yet to be added, divided by roads and playgrounds. The tenements contain either one, two, or three rooms each. In the front block there are a few with four rooms for exceptionally large families. The living-rooms have a carpet area of about 130 ft. by 10 ft., the bedrooms, where there are two, have each an area of 100 ft., and where there is only one bedroom to a tenement its area is 126 ft. The rooms are all supplied with fittings, every window has venetian blinds, and each living-room has a

firemantel presenting a triple combination of coal-burner, store for cooking utensils, and food cupboard, the latter ventilated into the outer air; and also a close range of a specially economical kind. The boundaries on each landing, which are used in common by the tenants of each block, are all furnished with two washing troughs, a copper, and drying lines. In separate buildings, placed in a central position, hot and cold baths are available for the free use of the tenants and their families every evening. In addition to this, each kind of family has the free use of a club-room, heated and lighted by electricity, in the evenings and on Sundays. Urn-rooms are also established, in which hot water is dispensed at breakfast-time and tea-time at absolutely boiling-point. The rents charged are, for a one-room tenement, 2s. 6d. to 3s. 3d. per week, according to position; for a two-room tenement, 4s. 3d. to 5s. 6d.; for a three-room tenement, 5s. to 6s. 3d. Upon the basis of these rents there is, after paying all outgoings, a net return of 3½ per cent., which, after providing for a sinking fund, is available for further building operations. The report of the trustees for 1900 shows that of the 2,210 families at that time housed in the Guinness dwellings the average weekly earnings of each tenant (including those of his family) was £1 0s. 1½d. The average weekly rent of each room was 2s. 1½d.

LEWIS. The foundation-stone of the new workhouse at Lewisham was heard on the 25th of Monday. The new workhouse, which will cost about £10,000, have been designed by Messrs. T. Winn and Sons, and the principal contractor for the work is Mr. J. T. Wright. The premises are completely separated from the main workhouse buildings, and have an entrance from the road at the east end. The workhouse is men's and women's shelters, which give access to the respective receiving-rooms, and, when necessary, to examination-rooms. Connected with these is an observation-room and an associated room for the better class of poor women and children. The workhouse is provided for the men, and twenty stone-breaking cells, and twenty sleeping cells for females, as well as lavatories, bathrooms, &c., and sitting and living rooms, and an office for the receiving officer. The buildings will be constructed of brick, with stone cladding on the outside of glazed brick, the floors of the sleeping cells, &c., being of concrete, and the remaining floors of well-worn paving.

LOWESTOFT.—The Belle Vue Hotel was opened last week. The premises, the main block of which faces east, with north and south wings have a frontage of 200 ft., were designed by Messrs. G. Baines and Sons, architects, of Clement's-Inn, London, and have been erected by Mr. Hubbard moved, and Mr. Piggett seconded, an amendment to the effect that the salary to be paid should be £1,500, with respect to £2,000 a year. The amendment was rejected, and the recommendation of the committee adopted. The improvements committee recommended that an estimate of £50,000 submitted by the Finance Committee should be approved, and that a contribution of that amount be made towards the cost of widening the Strand at Nos. 89, 90, and 94 to 101, proposed to be undertaken by the council of the city of Westminster. The recommendation was adopted, and it was intimated that it might be possible to carry out the widening of the Strand of the Great Park. After a long discussion the recommendation was adopted, with added instructions to the committee to again confer with H.M. Office of Works with a view to saving more of the trees than was contemplated in the scheme submitted.

The Technical Education Board asked the Council to approve plans and specifications for new technical institutions at Poplar and Brixton. The sites for both institutions have been secured. The Poplar Institute is to be mainly devoted to domestic engineering, navigation, naval architecture, and commercial classes, but provision will also be made for other subjects associated with engineering and the metal trades. The Brixton institution is intended for the instruction of persons engaged in the building trade. The recommendation of the committee adopted, and was resolved, on the recommendation of the Highways Committee, to make application in the next session of Parliament for powers to enable the Council to acquire, compulsorily, certain property at Greenwich to be used for the erection of an electricity generating station in connection with the working of the Council's Tramways by electrical power. Previously the Council had decided on having the generating station in Camberwell New-road, but difficulties had arisen with regard to the acquisition of property there. The Finance Committee reported that the adoption of the Greenwich proposal there would be a saving of £50,000 on the cost of acquiring additional property. The electrical engineer and the tramways manager were authorised to visit America at the expense of the Council, not exceeding £250, to inquire into the question of shallow water tramways, and also to see the latest system of tramway traction in America. The matter arose in connection with the suggestion to make a shallow underground tramway from Westminster to Finsbury-pavement, *via* the Strand, Piccadilly, and Chesham.

NEWCASTLE-ON-TYNE.—On Saturday the abattoir, which was erected in Steepney-bank and Lime-street, Quasburn, by the Newcastle Co-operative Society, Ltd., were formally opened. The new buildings form a quadrangle, and cover an area of 3,000 square yards, with frontages to Steepney-bank and Lime-street. The block of buildings at the north-west corner contains two dwelling-houses for caretakers, offices for the manager of the butchering department and clerks, men's messroom, lavatories, &c. Adjoining this block on the west side is a separate entrance to the block of stabling, sheds, workshops, and warehouses to be hereafter erected by the society, and for which plans have already been passed. The gateway on the east side opens into a paved yard, on the west side of which is a range of buildings containing the cattle and sheep slaughter-house and cooling-rooms, each 60 ft. long, 36 ft. wide, and 22 ft. high at the eaves, with a sloping roof, and a range of three brick roofs and large and lofty windows on each side. There are two double lines of overhead rails the full length of both buildings, on which are travelling cranes for raising the carcasses on to the running rails below. At one end of the cooling-rooms are placed the two large overhead travelling cranes, through insulated doors the refrigerating machinery is placed in the apparatus-room adjoining, and is driven by a National gas-engine of 17½ H.P. The cattle larder is 86 ft. long, 30 ft. wide, and 18 ft. high, and is divided from the slaughter-house by a cattle larder 73 ft. long, 31 ft. wide, and 18 ft. high. The cattle larder is the skin and cleaning house, and over part of the eclairage is the triple preparing room, 36 ft. long and 31 ft. wide. Beyond is the pig slaughter-house, 48 ft. long and 28 ft. wide. The second floor contains two rooms, 8 ft. by 10 ft. and 8 ft. by 10 ft. in width, to be used for manufactory and storage purposes, and connected therewith and to each floor below is a power-hoist. Mr. E. Shewbrooks, F.R.I.B.A., Grainger-street West, Newcastle, is the archi-

teet. The boilers and engines, motors and plant, have been supplied by the Furnishing Department of the Corporation (Wholesale Society, Ltd. (Newcastle branch), and have been erected under the superintendence of their engineer, Mr. Wm. Fletcher, and of Mr. J. W. Thwaites, on behalf of the Newcastle Co-operative Society.

SHEFFIELD.—The Building Trades' Exchange Co., Ltd., have recently purchased from the corporation land in Upper Charles-street and Cross Street, containing about 3,000 sq. yds. of ground, and upon it are erecting premises for the purpose of an exchange and club, with shops under. The exchange-room is 40ft. long, 30ft. wide, and 18ft. high. The secretary's office is 14ft. 9in. by 14ft. 6in. There is ample cloakroom accommodation for a medium business, and the building is to be of stone, 4ft. 6in. wide, leading up to the committee-room, 38ft. by 14ft. 6in., and 14ft. high, which will also be used for arbitration cases. A little further up the staircase is a billiard-room the same size as the exchange-room, and 15ft. 6in. high, affording room for two tables and a refreshment bar. In the upper floors are a small committee-room 15ft. 6in. by 14ft. 6in., a kitchen 23ft. 6in. by 14ft. 6in., and a caretaker's house, consisting of sitting-room, three bedrooms, and a bath-room. There is a back staircase, and a hall from the bottom of the building for communication from the kitchen to each floor. The shop is in Upper Charles-street, and is below the exchange-room. The elevations to the two streets are in brick with stone dressings, and are plainly treated. The contract was given to Messrs. J. S. Powell and Son, masons and bricklayers. Mr. J. S. Tenby, joiner; Messrs. Inman and Hayhurst, plumbers; Mr. W. Proctor, slater; Messrs. Hudson and Dore, plasterers; Messrs. Smith and Snape, painters; Mr. T. W. Ward, iron-founder, and the architect are Messrs. Gibbs and Flockton, also of Sheffield.

SPARKBROOK, BIRMINGHAM.—The new church of St. Agatha, at Sparkbrook, was dedicated by the Bishop of Worcester on Saturday afternoon. The church occupies a site adjoining the board schools in the Stratford-road, and has been erected from the designs of Mr. W. H. Bidlake, M.A., Birmingham, and under his superintendence. It is a Late Decorated in style, and accommodation is afforded for more than 1,000 worshippers. The materials employed are buff brick facing within and red and blue brick without, with Hollington stone and Bath stone dressings. The roofs are covered with grey-green Whitland Abbey slates. The tower is 120ft. high, the top of the parapet, and is surmounted by a fleche rising 40ft. higher. It is constructed to house eventually a peal of eight bells, and has large bellry lights in the upper part. The interior consists of a nave 120ft. long and 20ft. wide, separated from wide aisles by arcades of Hollington stone arches. The builders were Messrs. John Bowen and Sons.

SOUTHAMPTON.—The foundation-stones of a new board school in Foundry-road, Shirley, were laid last week. The main buildings are divided into two separate oblong blocks, that facing English-road being a two-story building, for girls on the upper floor, and for boys on the ground floor. The girls' department contains two school-rooms, each 60ft. by 23ft., and four class-rooms, each 25ft. by 25ft. connected by a corridor having two separate ranges of lavatories and two hat and cloakrooms. The rooms for art teachers' use are placed between the two floors, with their cases leading thereto. The arrangement of the four class-rooms can be converted into the resemblance of a central hall, by having sliding partitions and revolving shutter partitions in the place of brick division walls. The boys' department on the upper floor will be approached by two stone staircases, and the general arrangement and planning of the rooms is similar to that for girls on the ground floor, including the providing of movable partitions to classrooms. The two departments in this building will provide accommodation for 480 boys and 480 girls. The infants' school, which is a separate block of buildings, is placed at the north end of site, and the arrangement is one large schoolroom (70ft. by 24ft.), and fitted with sliding partitions, also six classrooms (25ft. 6in. by 23ft.), a marching hall, with narrow corridors as passages, and two cloakrooms, lavatories, and rooms for head teachers, &c. The rooms will be heated by warming grates in open fireplaces. The exterior elevations of school buildings are of a very plain

character. They will be of red brick, relieved by a little stone work, some coloured brick bands, moulded brick strings, projecting courses to eaves, and gables, slated roofs, with red ridge tiles, &c. The builders are Messrs. Jenkins and Son, of Southampton, who have taken the contract at £17,007. The plans were prepared by Mr. John H. Bilzard, architect and surveyor, 6, the school-house, in which the work is being carried out under his direction, with Mr. S. Jurd as clerk of works.

CHIPS.

At the last meeting of the Withington Urban District Council, the chairman of the Drainage Committee reported progress in regard to the new drainage scheme. Contracts in connection with the works were signed for a total amount of £100,439. The total cost of the scheme is estimated at £150,000. Mr. Swarbrick said that a hundred men were already employed in the construction of bacterial filters, and it was hoped that these filters would do much to improve the present very offensive condition of the brook.

The corporation of Calcutta have adopted plans drawn out by Mr. Banks-Gwyther in 1899 for the erection of a new central municipal office. It is proposed to erect a three-sided block of buildings around the present offices. The estimated cost of the new premises is over 51 lakhs, in addition to which there will be the cost of acquisition of the required land.

At the Audit House, Southampton, on Wednesday week, Colonel W. Langton (Coke, M.I.C.E., one of the Local Government Board inspectors, conducted an inquiry into an application of the Southampton Corporation for sanction to borrow £5,825 for the purposes of street improvement, and £4,000 for purposes of electric lighting.

Mr. F. J. S. Hopwood, C.B., Permanent Secretary of the Board of Trade, presided at the day's proceedings in the offices of that Department for the hearing of objections to the confirmation of an order issued by the Light Railway Commissioners, authorising the construction of light railways in the Canals of Bath and district.

A public appeal for funds has been issued by the Executive Building Committee of the proposed cathedral for Liverpool. Already there has been a gratifying response to the private requisition made, the responses up to date have amounted to £2,229.

At the town-hall, Wellington, Salop, last week, Col. Slacks, R.E., an inspector under the Local Government Board, held an inquiry relative to an application by the urban district council to borrow £10,000 for the purposes of the building of workmen's dwellings upon it.

Plans of the new School of Art for Peterborough to be built on a plot of land at the junction of Broadway with Geneva-street, were recently submitted to the city council by the city surveyor, and by the regulations of the South Kensington Education Department require that the rooms of the ground floor shall not be less than 15ft. high, and the upper rooms 10ft. On the basement floor there is to be an elementary school, modelling-room, workshops, and a room for mechanical work, and it is proposed to heat the building with hot-water pipes. On the upper story a science-room, lecture-theatre, and laboratory are to be provided. The total cost of the erection is estimated at a little below £2,000. The building is to be of red brick, with stone dressings.

Preparations for the erection of the new electrical construction works at Stafford for the Siemens & Co. have been commenced. Between thirty and forty workmen have been engaged in making excavations at the Queensville end of the site, and steps are being taken to clean out and level the pool which will be used as a reservoir. On this part of the site the railway sidings will be constructed, and the contract for the work, amounting to £1,300, has been let to Mr. C. J. Nevitt, contractor, of Stafford.

The first meeting of the memorial to the late Dean of Peterborough have come in so satisfactorily that the Cathedral Restoration Committee have given an order for the work of completing the restoration of the west front to be proceeded with forthwith. This includes the repair of the great central arch and gable and the two turrets flanking them, also the pinnacles of the bell tower. It is hoped, therefore, that the scaffolding which has for more than four years been the bane of the beauty of the cathedral, will soon be removed. About £500 is still needed.

The annual summer meeting of the Bristol and Gloucestershire Archaeological Society will be held at Chipping Campden, on August 20, 21, and 22, and will be held at Evesham on August 23, 24, and 25, and at Campden on the 26th. Ebrington, Hidcote, Quinton, Long Marston, and Mickleton on the 21st, and Buckland and Broadway on the 22nd.

Engineering Notes.

GREAT NORTHERN AND CITY RAILWAY COMPANY.

In their half-yearly report the directors state that at Drayton Park 1,200 linear yards of tunnel have been driven, and only 536 yards remain to connect with Essex-road. At Essex-road the station tunnels and connecting passages for the shunts are complete, and the main connection between the platforms are in hand. At the Regent's Canal the up and down line tunnels have been driven southwards to a point within 69 yards of the north end of Old-street Station, where the station tunnels are in course of construction. At the Finsbury pavement terminus the connecting passages are approaching completion, and the driving of the station tunnel is being rapidly proceeded with. Four hundred linear yards of double tunnel remain to be driven between the terminus and Old-street. Generally, the progress made is satisfactory, and it is anticipated that the whole of the tunnelling will be completed by the end of the current year. A contract for the electrical plant and equipment will shortly be placed.

The Westminster City Council has just decided to undertake the widening of the Strand eastward of the Cecil Hotel as far as Beaufort-buildings, on the terms proposed by the London County Council, who will contribute a sum of £50,000 towards the cost, estimated at £73,500.

Progress is being made with the laying out of the new Salford Northern Cemetery at Agecroft. The cemetery is about forty-five acres in extent, and when completed it will have cost £61,500.

At the Congregational Church, Wednesbury-road, Walsall, the memorial-stones were laid on the 11th inst. in connection with the enlargement and enlargement. The building was erected in 1859, and by the enlargement, which is being carried out from the designs of Messrs. Crouch and Butler, of Birmingham, two hundred additional seats will be provided and other improvements made.

The contract for building the new church at Oystermouth, near Swansea, has been taken by Mr. A. J. Howell, Glaston-place, Cardiff. The architect is Mr. E. M. Bruce-Vaughan, F.R.I.B.A., of Cardiff.

Mr. R. A. G. Malet, A.M.I.C.E., an inspector under the Local Government Board, held an inquiry at the town-hall, Ilkeston, on the 18th inst., touching the application of the corporation for sanction to borrow £4,300 for the purposes of laying out public walks and other improvements, and £7,495 for gasworks purposes.

At a meeting held at Sheffield of the Queen Victoria Memorial Committee it was reported that £1,465 had been promised for a local memorial, £602 towards the national fund, and a further sum of £675 to be allotted by the members. The committee discussed the question of the actual memorial to be erected in Sheffield, and decided that advertisements should be issued inviting designs for a memorial to include a statue, to be set in by Sept. 30, the design and material to be suited to this; already decided upon—where the monolith stands—the cost of the finished work not to exceed £3,000. Three premiums will be given to the designs, by the undersigned architects, the designs to be adjudicated upon by the committee in consultation with an expert.

The school board of Boston, Lincolnshire, have adopted plans by Mr. James Rowell, of that town, for a new paper mill, and a new school, and a new evening science classrooms, to be built at a cost of about £2,000.

The Light Railway Commissioners have submitted to the Board of Trade for confirmation an order made for the construction of light railways in Staffordshire in the parishes of Westnashfield and Short Heath, and the abandonment of certain light railways authorised by the Essington and Ashmore Light Railway Order of 1900.

The contract for pumping machinery in connection with the second irrigation territory recently completed at Ramsbottom (the largest in this country for waterworks purposes, the well being nearly 1,500ft. deep), has been placed with Messrs. Combe, Barber, and Cartwright, of Belfast, the amount of their tender being £6,150. The borehole pump will be of a novel design, embodying the principle of multiple valves for both suction and delivery, which will give a much greater water velocity than ordinary form of single valve. A very high duty has been guaranteed by the contractors.

The foundation-stones of a Wesleyan Sunday-school were laid at Bovey Tracey on Friday. The building will cost £480. Mr. Yee is the architect, and Mr. Turner the builder.

The past week has seen a revival of activity in business at the Tokenhouse-yard Mart. The sales registered at the Mart last week amount to £210,122 to which must be added the sum obtained on the sale of the Harwood estate, Fulham. In the country the Doxford-hall estate of 609 acres in Northumberland was sold for £32,200.

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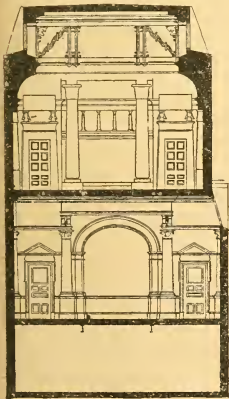
ILLUSTRATIONS.

NEW CHAPTER ROOM FOR THE SUPREME GRAND ROYAL ARCH CHAPTER OF SCOTLAND,—"BROAD OAK," ACCRINGTON.—CARVED OAK PANELLING, WALTHAM ABBEY.—THE OBSERVATORY, WESTGATE-ON-SEA.—NEW MUNICIPAL PALACE, PUEBLA, MEXICO.—GLASGOW CATHEDRAL.

Our Illustrations.

MASONIC TEMPLE, EDINBURGH.

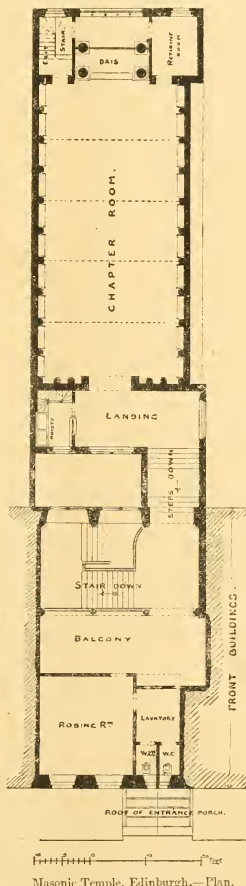
The accompanying photographic illustration is a reproduction of the architect's drawing of the chapter-room in the new Masonic Temple for the



Masonic Temple, Edinburgh.—Section.

Supreme Grand Royal Arch Chapter of Scotland, 75, Queen-street, Edinburgh, and shows his suggestions for the decoration. The Temple was dedicated with due Masonic Ritual in December last, but meanwhile is only temporarily decorated. The permanent decorations will be gone into possibly next summer. The chapter-room is in the style of an ancient Egyptian Temple. The accompanying section shows the arrangement of light the room with a clerestory, and as, of course, in a modern hall of such dimensions it was out of the question to have the shaded side aisles with their hypostyle colonnades, the cove over the engaged columns was introduced. Although this, as a detail, has necessarily no prototype in

Egyptian architecture, the effect of shadow at the sides is very pleasing and restful, besides giving a splendid surface for figure decoration. It has been suggested that these should represent the story of Isis and Osiris, the characteristic Egyptian deities, or be simply reproductions from the Book of the Dead. The other decorations will include Masonic emblems, some of which on the drawing will be recognised by duly



Masonic Temple, Edinburgh.—Plan.

qualified members of the Craft. The ceiling is carried on timber trusses, the details of which are Assyrian in style. The upholstery of the seats is deep crimson, and forms a sort of diado all round; while above that the general surface is treated in different tints of warm grey, enlivened with figures and devices in vermillion, in frames of Indian red, filled with a groundwork of French blue; while all the portions requiring strength, such as the lower portions of columns, styles of panels of ceiling, &c., have stencilled enrichments in black. The capitals of the large columns and the ceiling over the dais are in brilliant colours after the style of a peacock's tail. The chapter-room is on the first floor, and is reached by a

grand staircase, shown on the accompanying plan. On the ground floor, and directly opposite the chapter-room, is a dining-room of similar proportions, while at the front are the Grand Secretary's offices, and on the area flat the kitchens and caretaker's house. One peculiarity of the construction worthy of note is the side wall of the upper hall carries on the beams resting on crossbeams over the lower hall to give light and ventilation to the latter. The architect is Mr. Peter L. Henderson, of Edinburgh.

"BROAD OAK," ACCRINGTON.

This mansion has been erected at Broad Oak, Accrington, for Mr. G. W. Macalpine, J.P. The architect is Mr. T. L. Watson, and the drawing was on view at this year's Exhibition of the Royal Scottish Academy.

CARVED OAK WALNUT-COAT WORK, WALTHAM ABBEY.

This 16th-century carved oak panelling recently came from an old house near Waltham Abbey, Essex. It probably formed part of the decoration of the Abbey House at Waltham Abbey, which was granted in the reign of Henry VIII. on lease to Sir Anthony Denny. In the early part of the 17th century Edward Denny, grandson of Sir Anthony, Baron of Waltham and Earl of Norwich, is supposed to have used this panelling in his new house erected in the abbey grounds. This mansion was pulled down in 1770, and the carvings now in the Victoria and Albert Museum, South Kensington, were bought and placed in a house in the town. The Tudor rose, the portcullis, and the pomegranate of Katharine of Aragon are repeated several times, as well as the arms of Blackett (Ar. a chevron sa. between three mullets az.), and another shield not identified. There are about 90 different panels; some are carved with profile busts within circular medallions, Gothic foliage, heraldic devices, and other ornamental features. (See *Essex Review*, "Carved Panels at Waltham Abbey," by J. Chalkley Gould, Vol. II. 1893, p. 115.) We are indebted to the South Kensington Museum authorities for the photographs taken from the originals, which form a most important addition to the unique collection of historic woodwork now housed in the Victoria and Albert Museum.

THE OBSERVATORY, WESTGATE-ON-SEA.

(See description and sketch plan on page 100.)

NEW MUNICIPAL PALACE, PUEBLA, MEXICO.

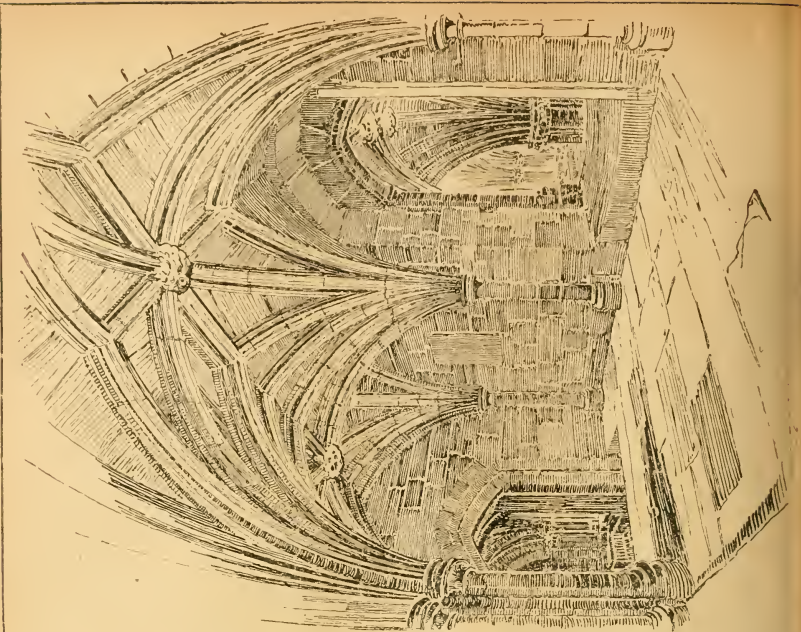
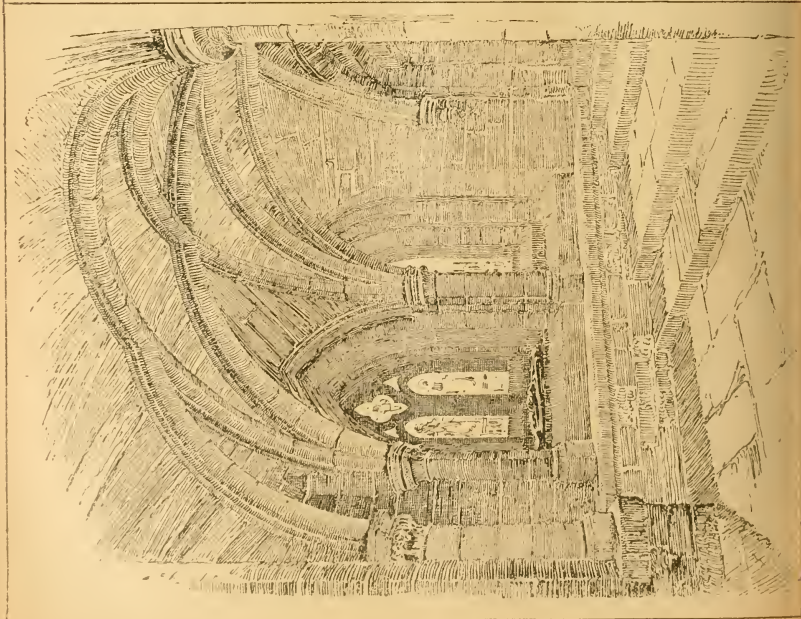
The Puebla (Mexico) Municipal Palace, of which we give a view of the front, is one of the most important modern erections in that Republic. The author of the design, Mr. C. J. S. Hall, is a young English architect who has resided for the last twelve years in Mexico. Mr. Hall was once a student of the Royal Academy, and was a pupil of Mr. Henry Hall, F.R.I.B.A., of 19, Doughty-street, London. This important work was gained in competition with prominent Mexican architects. The design received the unanimous vote of the Puebla aldermen, who themselves selected the design, and President Diaz, on being shown the plans, expressed his approval of the aldermen's choice. President Diaz was lately entertained at a banquet in the new council-chamber, being attended by most of his ministers and members of the diplomatic corps. On that occasion Mr. Hall received many marks of attention from those present. When the building is completed, Mr. Hall is to be presented with a gold medal by the Puebla City Council. The cost of the building, when finished, will amount to 300,000*l.* silver. Mr. Hall last year was named Professor of Architecture in the Puebla State University by General Martinez, the Governor of the State—a very unusual honour to a foreigner in Mexico.

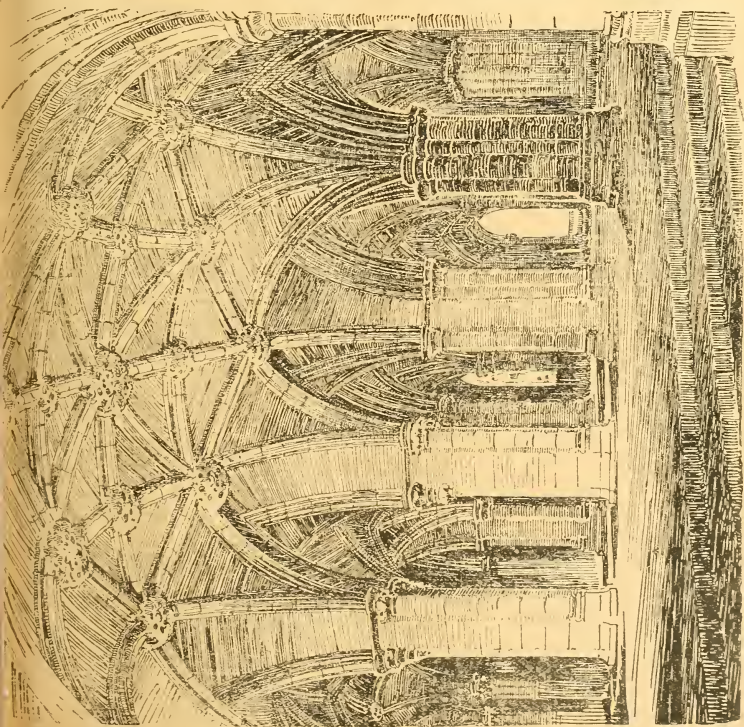
GLASGOW CATHEDRAL.

(For description and further sketches, see pages 96 and 97.)

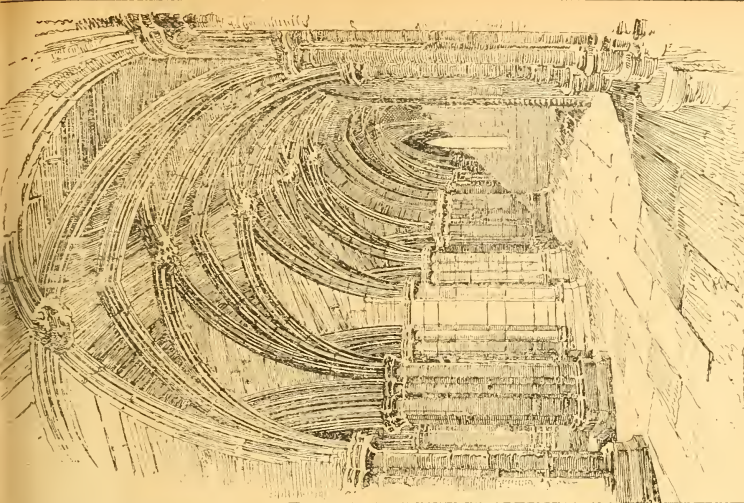
Mr. J. W. Allison, 25, recently a student at Newlyn, near Funchal, has been selected from 34 applicants to succeed Mr. Henry Geoffroy, for nearly half a century master of the Penzance School of Art.

At Walkhampton, on Friday, foundation-stones were laid of a new Wesleyan chapel. The building is to be erected by Messrs. Poop and Sons, of Plymbridge, from designs by Mr. H. J. Snell, of Hordmouthe. It is to be of local stone, with brick dressings, and a slated roof.





The Fourth Period of the Vaulting—The Middle Compartment.



The Second Period of the Vaulting—The Lower Aisle.

GLASGOW CATHEDRAL.

PARLIAMENTARY NOTES.

WESTMINSTER ABBEY AND THE CORONATION.—Lord Belper as the First Commissioner of Works, whether any arrangements had been made for preparing Westminster Abbey for the Coronation ceremony; and if the Dean and Chapter and their architect would retain any construction of the Abbey during the progress of the works. Mr. Akers-Douglas: No arrangements have yet been made for preparing Westminster Abbey for the Coronation. The answer to the second part of the question is also in the negative, as, according to precedent, the work would be undertaken by my Department.

LONDON TRAMWAY EXTENSIONS.—A Select Committee of the House of Lords disposed, on Tuesday, of the London County Council (Tramways and Street Widening) Bill, which had occupied their attention for several days, and under which power was sought to enable the Council to construct new tramways, to reconstruct and alter existing tramways, to equip them for electrical traction, and to widen streets where necessary for the proper conduct of the tramways. In the result the committee declined to sanction the proposed line from Camberwell-green to Dulwich, the line along Stamford-street, Blackfriars-road and along Southwark-street, and the extension of the line in the Waterloo-road, so as to terminate some 300 yards near Waterloo Bridge to be at present the case. They authorised the construction of lines from the existing tramway in the Battersea Park-road to the Albert Bridge; from Lower Tooting along Garratt-lane to Wandsworth, connecting with existing tramways; and from the terminus of the existing tramway at the Archway Tavern, Highbury, to the county boundary, where eventually it is hoped connection will be made with a system of tramways which the Middlesex County Council are authorised to construct.

THE NEW GOVERNMENT OFFICES.—Mr. Whitmore asked the First Commissioner of Works, on Tuesday, whether any definite decision had now been come to with regard to the carrying out of the designs of the late Mr. J. M. Brydon for the new government offices in Parliament-street. Mr. Akers-Douglas: It has been definitely decided that all Mr. Brydon's building, all the plans for which are in my possession, shall be carried out by the officers of the Corporation, and the contracts will be entered into under the supervision of the principal architect and of Sir John Taylor. In reply to Lord Belper, Mr. Akers-Douglas added: I hope thereby to avoid any considerable saving.

THE QUEEN VICTORIA MEMORIAL.—Dr. Farquharson asked the First Commissioner of Works on Friday whether the competing designs for the late Queen's Memorial would be exhibited to the public before one of them was selected and finally approved. Mr. Akers-Douglas: The responsibility of selecting the designs for the late Queen's Memorial, as the hon. member is aware, in no way devolves upon me. By the courtesy of the committee I am able to inform him that the designs have been selected by the executive committee, and will be submitted to the King and the general committee next week.

I will undertake to inform the committee of the hon. gentleman's question. I have already stated that should the selected design involve an alteration of the Mall, I think I can undertake to exhibit the design to the House. Dr. Farquharson: Does the right hon. gentleman intend to take any action in regard to the design in another place that models of these designs should be exhibited publicly? Mr. Akers-Douglas: No, sir.

It has been decided to add new medical school buildings to the University of Dundee at an estimated outlay of £20,000, of which more than three-fourths is in hand.

At Lichfield, on Saturday, Mr. R. P. Cooper, of Stafford, High Sheriff of Staffordshire, laid the foundation-stone of the new grammar school which is about to be erected on Borrowock Hill, which the Conduit Lands Trustees have given for the purpose. The old Lichfield Grammar School was founded by Edward the Sixth. The new scheme, which is part of a still larger one, is to cost upwards of £30,000. The accommodation in the new buildings will be for 125 boys, 22 resident scholars, five boarders, assistant masters, nurses, nuns and female attendants, and servants.

Dr. W. H. Cummings, the Principal of the Guildhall School of Music, on Saturday, unveiled, on behalf of the Incorporated Society of Musicians, a memorial tablet, which has been affixed outside the dwelling-house, No. 3, Bulwer-street, to mark the walk, the birthplace of the late Sir Arthur Sullivan. The tablet, in dark Doulton ware, the gift of Mr. H. Leese, Doulton, bears the following inscription in gilt letters: "The Incorporated Society of Musicians, London Section. In this house was born, 1842, Sir Arthur Sullivan, musician. Died 1900, and buried in St. Paul's Cathedral."

Our Office Table.

An exhibition of some six hundred historical and architectural photographs has been arranged by the Board of Education in the galleries of the Indian Section of the South Kensington Museum. The most important are the photographs contributed by Sir Benjamin Stone, M.P., who may be regarded as the unofficial photographer to the Government. Old British houses and church halls are well represented, and the treatment of Astley Hall is typical, two external views and two interiors being shown. One of these interiors portrays the Long Gallery, with its old panelling, low ceiling, quarried windows, and carved furniture. Another room shows the curious and low curved bedstead. Contemporary political life is represented by many groups photographed by Sir Benjamin Stone on the terrace of the House of Commons, each group being dated and the names being attached; moreover, many of the quarter ceremonies of the Houses of Parliament are illustrated, including the Guy Fawkes search party as it was ready for duty on February 14 last. Among the illustrations of village customs and ceremonies are the Royal Maundy ceremony and "Dressing of the Wells with Flowers" at Tisbury, in Wiltshire. The records of the Public Record Office have been brought to the sight of many by Sir Benjamin Stone's camera, and legible as regards almost every letter, seal, and signature, we see a reproduction of the Bull of Pope Clement VII. confirming Henry VIII. in the title of the Defender of the Faith, in White Castle, St. James's Palace, St. Margaret's Church, Westminster, and many other places contribute much which adds interest. The exhibition is open to the public, without charge, every day—on Mondays, Tuesdays, and Saturdays from 10 to 10; on Wednesdays, Thursdays, and Fridays from 10 till 6; and on Sundays from 2 till dusk.

The Bill introduced into the House of Commons on Tuesday by Sir J. Blundell Maple, "to vest the undertakings of the London Water Companies in a single public authority," is backed by Mr. Cust, Mr. Kimber, and Mr. A. H. Morton. It is supported by the London County Council, the members of which, exclusive of the chairman and vice-chairman, are to be appointed as follows:—Sixteen by the County Council, one by the City Corporation, one by the council of each of the Metropolitan Boroughs, four each by the Councils of the County of London, the County of Essex, and Surrey; and two each by the Conservators of the Thames and the Lea. The salary of the chairman is fixed at £3,000 a year, that of the vice-chairman at £1,500, and of the deputy-chairman, if one is appointed, at £500. The holders of all debt and stock and shares in the existing companies are, by the Bill, to be given the same income as they at present receive in a new Water Stock to be created under the measure, and, where a prospective increased value exists, the same is to be provided for actuarially. All benefits arising from economies of management, to be duly maintained, where the water and service will go to the consumers.

Ten years ago the Warwickshire County Council undertook the direct management of the main roads, and a report has just been issued by Mr. J. Willmot, the county surveyor, in regard to the work done during that period. The total cost of these roads, including improvements, during the ten years was £249,888, or an average of £24,988 per year. The cost of the improvements was £6,653, which, deducted from the expenditure of ordinary maintenance, showed a rate of £50 7s. per mile. This was a lower rate than that at which the main roads in some of the neighbouring counties have been maintained, where the traffic on the whole was not greater than it was on the Warwickshire roads. There was no doubt, remarked the surveyor, that the use of larger quantities and better quality of materials and the introduction of steam rolling had caused the roads to be now judged by a higher standard of excellence than they were in 1891. At the time the council took over the maintenance of the roads, steam rolling was almost unknown upon them, the material being left to be consolidated by the traffic. Since then the greater part of the material has been consolidated by steam rollers. The amount paid for day labour, including the inspectors' salaries, had been £39,448, equal to about 24 per cent. of the total expenditure. In 1892 the average rate of wages was

15s. 5d. per week; but it had now been increased to 16s., an advance of about 1 per cent. The cost of materials had been £115,826, or an average of £11,582 per annum—nearly 48 per cent. of the total expenditure. In all about 13 miles of new drains and 14 miles of kerbing have been laid down, whilst 35 miles of new footpaths have been formed.

"SPENDING AND SAVING" is the title of an excellent little primer of thrift and guide to the Friendly Societies, written by Mr. Alfred Pinhorn, and published by Messrs. Cassell and Co., Ltd. The book is dedicated to Mr. Passmore Edwards, in recognition of his provision of many hospitals, institutes, libraries, settlements, &c., and particularly of his establishment of the Passmore Edwards Convalescent Home for Members of Friendly Societies at Herne Bay. The author's aim is to show why and how thrift is to be practised, and the greater part is devoted to the work of the Friendly Societies. We strongly recommend the book to all who want to grasp at a glance, as it were, what thrift has done for the workers of England, without patronage, and who believe that its encouragement and wise direction offer the best guarantees for the further amelioration of the condition of the masses.

MR. A. REA, of the Archeological Survey in the Madras Presidency, has made some interesting discoveries during excavations at Adichanallur, a place about sixteen miles south-east from Tinnevely. The first excavations were carried out last year, and, on Mr. Rea's recommendation, Government agreed to conserve an area extending over 114 acres. In this ground burial urns were found, and the whole area at average distances of about 6ft. apart, and at depths of from 3ft. to 10ft. or 12ft. below the surface. About the middle of the area some 3ft. of the surface is composed of gravel, with decomposed quartz rock below. This rock has been hollowed out to receive the urns with a separate cavity for each. Last year over 600 articles of metal and pottery were found, and this season over double that number, including many unique and curious objects in bronze, iron, and pottery, have been unearthed. The whole collection made by Mr. Rea includes seven gold-chased ornaments—three small rings of 10, 16, and 18 carats; two of thin plates of gold, ornamented with geometrical dotted designs, and all were found folded up; some 373 articles of iron, including falds, tools, and weapons, and 188 bronze objects—all either vessels or personal ornaments. In 1876 Dr. Jagers of 10, had visited this site, and obtained a considerable collection of weapons, utensils, and implements for the Berlin Museum. No one called attention to it on behalf of any of our Indian or home museums, and it was left to Mr. Rea to rediscover it, after nearly a quarter of a century.

UPWARDS of 90 boxes for artesian water have been sunk on Government account in New South Wales. The most expensive was the Delgoly bore, on the Moree-Bogardilla road, which was sunk 4,086ft., and cost £10,600. The flow is equal to 745,000gal. per day; the temperature of the water when it reaches surface is 130° Fahr. The next most costly was the Tulare bore, which cost £2,498, and yielded 69,000gal. per day. The temperature of the water is at the Clifton and Tinaroo bores, between Milparinka and Wanaaring. It is normally 135°, and varies very little.

MESSRS. ROBERT BOYLE AND SONS, Ltd., of 64, Holborn Viaduct, have republished the article on "The Progress of Natural Ventilation," which appeared in our columns on June 28, supplemented by a number of extracts from the pages of our principal contemporary periodicals, and the writings of Dr. Parkes, Dr. Hayward, Lord Houghton, and others, endorsing the preference of all conversant with the subject of a properly designed and applied system of natural ventilation over all others. The booklet is very tastefully produced, and any architect, builder, or sanitarian who has not seen a copy should apply for one.

FIFTY concrete foundation piers from 4ft. to 8ft. in diameter are being built at Chicago for the columns of the new Tribune building by Messrs. A. W. Smith and Sons, of that city. The method employed is the same as that used a

LIST OF COMPETITIONS OPEN.

Manchester—Fire and Police Station, &c.	£75,000 limit	£300, £200, £100	The Town Clerk, Town Hall, Manchester	July 31
Greenock—Masonic Hall	£100 £50	£100	James Lowery, 39, Main-street, Greenock	Aug. 1
Leeds—Additions to Church	£100	£100	The Rev. T. Houghton, Ecclesall Vicarage, Sheffield	Sept. 1
Leamington—Laying-out Ground, on Western Promenade	£125 merged, £100	£100	T. H. Cornish, Town Clerk, Public Buildings, Penance	Sept. 1
Leeds, S. W.—Public Baths, King's-road	£200 merged, £100, 500p.	£200 merged, £100, 500p.	The Public Baths Committee Office, 171, King's-road, Chelsea, S.W. Oct. 1	
Manchester—Baths and Washhouses	Old Kent-road			
(A. Saxton Seal, F.R.I.B.A., Assessor)				
Leamington—Twenty Workmen's Dwellings	150p., 75p., 50p.		The Town Clerk, Town Hall, Camberwell, S.E.	29
S. Peter Port, Guernsey—School (750 places)			John Gannagan, Borough Surveyor, Town Hall, St. Dunley	29
			The Rev. G. K. Lee, Rector, St. Peter Port, Guernsey	29

LIST OF TENDERS OPEN.

BUILDINGS.

Leicester—Renovable Gymnasium Floor, Bath-lane Baths	Baths Committee	Geo. E. Maybery, M.I.C.E., Borough Surveyor, Town Hall, Leicester	July 27
Willingdon-on-Tyne—Premises	Industrial Society, Ltd.	J. Walter Hanson, Architect, 79, King-street, South Shields	27
Warrington—Alterations to Haughton Hall	School Board	Clark and Moscrop, Architects, F.F.R.I.B.A., Fethams, Darlington	27
Leamington—Public Conveniences, Kimberley Park	Corporation	H. E. Hensell, Station Buildings, St. Albans	27
Stow Vale—Four Houses, Railway View	Glenberrig School Board	John H. Genn, Town Clerk, Municipal Buildings, Falmouth	27
Trumfield—Teacher's House	F. W. Ellis	Joseph Thomas, 15, Victoria-road, Ebbw Vale	27
Batley—Six Seafarer's Houses, Snowden-street	Rainhill Gas Co. Directors	George Gregory, Architect, Stoneyhead	27
Stamhill, Liverpool—Pulling Down One Chimney	Cornforth & Coxhoe Co-op. Society	Albert Allatt, 39, Gordon-terrace, Dark-lane, Batley	27
Tramton Grange—Twelve Cottages	Managers	The Secretary, Rainhill Gas Company, Rainhill	27
East Ham—Classroom, &c.	Monmouthshire Asylum Committee	The Clergy Estates Office, 19, Union-terrace, Aberdeen	27
Leamington—Additions to Bowdler Barr Farm	Trades Council	The Secretary, Branch Stores, Trimpleton Grange	27
Leamington—Rebuilding Farmhouse at Bowdler Barr Farm	Monmouthshire Asylum Committee	Byron Noel, Surveyor, Oakham, Woking	27
Leamington—Six Workmen's Cottages	Calceolus Railway Co.	M. Duncombe Mann, Clerk, Embankment, E.C.	27
Leamington—Additions to Central School	Technical School Committee	Griffiths and Jones, Architects, Tonypandy	27
Leamington—Kirkham Improvements	Newcastle Breweries	W. S. Bradshaw, 6, South-parade, Leeds	29
Leamington—Rebuilding Army Arms Hotel	Leamington Borough Council	William Smith, 321, Buchanan-street, Glasgow	29
Leamington—Additions to Police Station	Leamington Borough Council	William Watson, Architect, Wakefield	29
Leamington—Alterations to Old George and Dragon	Leamington Borough Council	John Smith, Borough Surveyor, Berrie	29
Leamington—Additions to Technical College	Leamington Borough Council	T. Oswald and Son, Architects, 28, Mosley-st., Newcastle-on-Tyne	29
Leamington—Kitchen, &c.	Leamington Borough Council	H. Miller, M.I.C.E., County Surveyor, 16, Museum-street, Ipswich	29
Leamington—Workhouse Infirmary	Leamington Borough Council	W. G. Williams, Architect, 220, High-street, Bangor	29
Leamington—Steadings at Moss Side	Leamington Borough Council	Treeman, Stiles and Gaskell, Architects, 11, Carr-lane, Hull	29
Leamington—Child and Dispensary	Leamington Borough Council	The Borough Surveyor's Office, Bury St. Edmunds	29
Leamington—Shed 108ft. by 80ft.	Leamington Borough Council	Henry Bruce, Architect, County Buildings, Cupar-lea	29
Leamington—Baths at Workhouse	Leamington Borough Council	F. E. P. Edwards, A.R.I.B.A., City Archt., Chap-lane, Bradford	29
Leamington—Industrial Hall	Leamington Borough Council	A. Buttery and S. B. Birds, Architects, Queens-street, Morley	29
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	William Reid, Architect, Saltoun-square, Fraserburgh	30
Leamington—Additions to King Hospital	Leamington Borough Council	John R. Dower, Union Clerk, Poor-Law Office, Dundargan	30
Leamington—Additions to Workhouse	Leamington Borough Council	W. and W. Dixon, Architects, 3, Eastgate, Barnsley	30
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	J. Berry, Architect, 9, Queen-street, Huddersfield	30
Leamington—Baths at Workhouse	Leamington Borough Council	C. O. Francis, Leamington Chambers, 1, Richmond-st., Liverpool	30
Leamington—Industrial Hall	Leamington Borough Council	Henry A. Cully, A.M.I.C.E., Municipal Buildings, Cork	30
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	Arthur W. Bradley, A.M.I.C.E., Borough Engineer, Bury	30
Leamington—Additions to King Hospital	Leamington Borough Council	The Engineer's Office, Handly, N.B.	30
Leamington—Additions to Workhouse	Leamington Borough Council	John R. D'Arcy, Union Clerk, Boardroom, Glenamaddy	31
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	Sampson Hill, Architect, Green-lane, Relfrith	31
Leamington—Baths at Workhouse	Leamington Borough Council	Richard Arrott, 5, Wilber-lane, Beveland	31
Leamington—Industrial Hall	Leamington Borough Council	J. Shepherdson, Architect, 15, Manor-street, Bridlington	31
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	Cook and Edwards, Architects, Bridlington	31
Leamington—Additions to King Hospital	Leamington Borough Council	James and Jackson, Architects, River End Chambers, Grimsby	31
Leamington—Additions to Workhouse	Leamington Borough Council	Wm. Perkins, Architect, Victoria-street, Bishop Auckland	31
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	J. Berry, Architect, 9, Queen-street, Huddersfield	31
Leamington—Baths at Workhouse	Leamington Borough Council	Bailey and McCann, Bridge-street, Walsail	31
Leamington—Industrial Hall	Leamington Borough Council	Senior and Clegg, Architects, 15, Regent-street, Barnsley	31
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	James Bell, Clerk, Surbiton	31
Leamington—Additions to King Hospital	Leamington Borough Council	J. Waters, C.E., Enderbury	31
Leamington—Additions to Workhouse	Leamington Borough Council	John Parker, A.M.I.C.E., City Surveyor, Mansion House, Hereford	31
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	The Secretary, Park Hall, Cwmafan, nr. Treorchy, Rhondda Valley	31
Leamington—Baths at Workhouse	Leamington Borough Council	Louis Emley, C.E., Drogheda	31
Leamington—Industrial Hall	Leamington Borough Council	H. Bewick, County Architect, Newgate-street, Chester	31
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	Henry Card, A.M.I.C.E., 10, North-street, Leeds	31
Leamington—Additions to King Hospital	Leamington Borough Council	W. J. Moore, Architect, Whitehall Buildings, Anson-street, Belfast	31
Leamington—Additions to Workhouse	Leamington Borough Council	Barnes and Coates, A.R.I.B.A., 41, Fawcett-street, Sunderland	31
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	A. Byers, Clerk, Council Offices, Ashton-in-Makerfield	31
Leamington—Baths at Workhouse	Leamington Borough Council	E. M. Bruce Vaughan, F.R.I.B.A., Cardiff	31
Leamington—Industrial Hall	Leamington Borough Council	Wm. and W. J. Bagg, Architects, Arcade Chambers, Cardiff	31
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	Herb. Tilton, Architect, Railway-road, King's Lynn	31
Leamington—Additions to King Hospital	Leamington Borough Council	Edmund Kirkby, F.R.I.B.A., 5, Cook-street, Liverpool	31
Leamington—Additions to Workhouse	Leamington Borough Council	The Secretary, R.M. Office of Works, Store-st., Gate, S.W.	31
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	Thomas Arnold, C.E., Castle Buildings, Llanelli	31
Leamington—Baths at Workhouse	Leamington Borough Council	F. Newman, County Surveyor, St. Thomas-street, Hyde, L.W.	31
Leamington—Industrial Hall	Leamington Borough Council	Bailey and Foley, Architects, Castle Park, Lancaster	31
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	Francis Chalmers, Manager, Town Hall, Torquay	31
Leamington—Additions to King Hospital	Leamington Borough Council	John Vaughan, Clerk, Town Hall, Merthyr	31
Leamington—Additions to Workhouse	Leamington Borough Council	Charles Smith and Son, Architects, Tipton	31
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	C. Hodgson Fowler, F.R.S.A., Architect, The Colliery, Durham	31
Leamington—Baths at Workhouse	Leamington Borough Council	Edgar Dowd, A.R.I.B.A., 31, High-street, Cardiff	31
Leamington—Industrial Hall	Leamington Borough Council	Charles Smith and Son, Architects, Reading	31
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	O. Evans, Architect, Pontypridd	31
Leamington—Additions to King Hospital	Leamington Borough Council	Lyle and Constable, District Council Offices, Haylake	31
Leamington—Additions to Workhouse	Leamington Borough Council	A. Saxton Seal, F.R.I.B.A., 22, Southampton Bldg., Chancery-l., W.C.	31
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	W. H. Waller, Architect, Queen-street, Burslem	31
Leamington—Baths at Workhouse	Leamington Borough Council	J. C. Wilson, 168, Tordennen-road, Burnley	31
Leamington—Industrial Hall	Leamington Borough Council	Willie Wrigley, Architect, & Westgate, Walsfield	31
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	W. H. Waller, Architect, Queen-street, Burslem	31
Leamington—Additions to King Hospital	Leamington Borough Council	J. C. Wilson, 168, Tordennen-road, Burnley	31
Leamington—Additions to Workhouse	Leamington Borough Council	T. Taylor Scott, Architect, 45, Lower-street, Carlisle	31
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	T. Archibald Lums, Architect, Guildhall Chambers, Exeter	31
Leamington—Baths at Workhouse	Leamington Borough Council	J. Broadmore, St. Mary Bourne, Andover	31
Leamington—Industrial Hall	Leamington Borough Council	H. Alcock, Architect, Bentinck Buildings, Nottingham	31
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	H. Alcock and Cressall, Architects, Victoria Chambers, Colchester	31
Leamington—Additions to King Hospital	Leamington Borough Council	T. H. Barker, Fincham	31
Leamington—Additions to Workhouse	Leamington Borough Council	H. Alcock, Architect, Bentinck Buildings, Nottingham	31
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	H. Harding and Son, Architects, 35, High-street, Salisbury	31
Leamington—Baths at Workhouse	Leamington Borough Council	John Walker, North Arch House, Northallerton	31
Leamington—Industrial Hall	Leamington Borough Council	C. E. Bennett and Co., Birch Vale Works, Birch Vale	31
Leamington—Lodge and Boiler-Houses Extension	Leamington Borough Council	A. N. Brumley, Archt., Prudential Bldgs., Queen-st., Nottingham	31
Leamington—Additions to King Hospital	Leamington Borough Council	E. H. Lingen-Barker, Architect, 146, St. Owen-street, Hereford	31
Leamington—Additions to Workhouse	Leamington Borough Council	W. Walker, 1, Sandhurst-terrace, Walsley, Rotherham	31
Leamington—Shed, 108ft. by 80ft.	Leamington Borough Council	C. P. Ayres, Architect, Burdett, Warrington	31

PAINTING—*continued.*

Jusselburgh—Municipal Buildings
 Nelson—Electric Light Station
 Tillamash—Board Schools
 North, Keighley—Ten Houses and Shops
 Torley—Eight Houses, Fountain-street

Town Council
Electricity and Tramways Commit
John Bland

Lyle and Constable, 3, Hill-street, Edinburgh	Aug. 19
B. Ball, A.M.I.C.E., Borough Engineer, Town Hall, Nelson	" 21
F. H. Fisher, Clerk, The Mount, Killamarsh, near Sheffield	" 21
F. E. Drury, 53, Queen's-road, Keighley	" 21
Pearson and Ainsworth, 74, Britannia-road, Morley	" 21

ROADS AND STREETS.

[illegible]

Harbour Trustees	J. Thompson, jun., Harbour Engineer, Dundee	July 27
Camberwell Borough Council	Wm. Oxley, Borough Engineer, Town Hall, Camberwell	28
Leamington Borough Council	The Surveyor's Department, Town Hall, Leamington	29
Camberwell Borough Council	Wm. Oxley, Borough Engineer, Town Hall, Camberwell	29
Town District Council	The Surveyor, West-street, Shoreham	29
Leamington Borough Council	The Surveyor's Department, Town Hall, Leamington	29
Leamington Borough Corporation	The City Engineer's Office, Municipal Buildings, Leeds	29
Leamington Borough Council	The Surveyor's Department, Town Hall, Leamington	29
Camberwell Borough Council	Wm. Oxley, Borough Engineer, Town Hall, Camberwell	29
Leamington Borough Council	The Surveyor's Department, Town Hall, Leamington	29
Leamington Borough Corporation	W. L. Perry, Chief Engineer, Town Hall, Leamington	29
Leamington Borough Corporation	The Borough Engineer's Office, Boscawen	29
London County Council	The Architect's Department, 10, Abchurch Lane, E.C. 4, S.W.	30
Leamington District Council	H. H. Humphries, Esq., Public Hall, Edlington, Birmingham	31
Borough Council	H. H. Scott, Borough Surveyor, Town Hall, Howe	31
Leamington Council	Mr. John Lee, City Engineer, Leamington	31
Town Council	T. Frame and Son, Architects, 43, Mill-street, Alkington	Aug 1
Town District Council	J. Newman, F.R.I.B.A., Surveyor, Council Buildings, Branksome	2
Town Council	Robert Ball, A.M.I.C.E., Borough Engineer, 10, Beulah	3
Town Council	A. E. Stickland, Borough Surveyor, Alma-road, Windsor	3
Leamington Borough Corporation	Robert Ball, A.M.I.C.E., Borough Engineer, 10, Beulah	3
Town District Council	George Ball, A.M.I.C.E., Surveyor, Town Hall, Bechill	3
Town Sanitary Authority	J. Petre, Borough Surveyor, Jarrow	3
Leamington's Engineering Director	The Corporation's Engineering Department, West-street, Leamington	3
Cleethorpe-with-Thorness U.D.C.	Ernest Eushton, Surveyor, Poplar-road, Cleethorpe	3
Leamington Borough Corporation	R. L. Rotherham, Esq., Municipal Buildings, Leamington	3
Leamington Borough Corporation	Thomas Longdon, Borough Engineer, Town Hall, Warrington	3
Leamington Borough Corporation	The Direction du Service Speciale, 1 Square Stephanie, Ostend	3
Leamington Borough Corporation	Leamington, Ralph, and Sons, Kingston-on-Thames	3
Leamington Borough Corporation	M. E. Gloyne, M.I.C.E., Borough Engineer, Town Hall, Eastbourne	13
Leamington Borough Corporation	J. Thacker, Municipal Office, Ramscroft-road, Mile End, E.	13
Leamington Borough Corporation	Powell, Kingston-on-Thames	13

SANITARY.

Alnmouth—Sanitary Conveniences, Kimberley Park
 Averslath—Sewer
 Fernzabulox—Lavatories at Gloomhavern School
 Barmston—Sewer, Drainage and Sanitary Work, Bridge School
 East Ardsley—Sewer
 Sowerby Bridge—Culvert
 Sowerby—Sewering and Forming Private Streets
 Whitley—Sewerage Works
 Moorfields—Drainage and Sanitary Asylum
 Leeds—Set of Conveniences, Pottennewton Park
 Walsall—Sewering Wednesday-street
 Pudsey—Sewers
 Upton-upon-Severn—Sewers, &c.
 Darlaston—Sewerage Works
 Haslocks—Latrine, &c., at School

Urban Corporation	John H. Genn, Town Clerk, Municipal Buildings, Falmouth	July 27
Urban District Council	S. Percy Anderson, Surveyor, 22, Prospect-street, Calverton	27
Urban District Council	W. Mitchell, Clerk, 10, Victoria-street, Falmouth	27
Metropolitan Asylums Board	T. Duaneau Mann, Clerk, Office, Embankment, E.C.	27
Urban District Council	Edward Brock, Tinsler, near Wickfield	27
Urban District Council	The Surveyor's Office, Town Hall, Southey Bridge	27
Urban District Council	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool	31
Highways Committee	P. Spencer, A.M.I.C.E., 10, Howard-street, North Shields	31
Urban District Council	H. Bewick, County Architect, 10, Chelmsford-street, Chelmsford	31
Urban District Council	The City Engineer's Office, Municipal Buildings, Leeds	31
Urban District Council	The Borough Surveyor's Office, Broadchurch, Walsall	31
Urban District Council	Joseph Jones, Borough Architect, 10, Church-lane, Pudsey	31
Urban District Council	E. B. Marten, M.I.C.E., 13, Church-street Chambers, Stourbridge	31
Urban District Council	Urbanark and Son, E. C., 13, Church-street, Stourbridge	31
Urban District Council	Clayton Redburn, Architect, 123, Queen's-road, Brighton	31

STEEL AND IRON

Christchurch, Hants—Water-Pipes (1,800yd. 8in., 2,200yd. 6in.)
 Christchurch, Hants—Iron Water Pipes (100 tons)
 Christchurch, Hants—Cast-Iron Gull-pipes (14,740 ft. 3in. to 16in.)
 Sydney, N. S. W.—Steel Rails (100 tons)
 Glasgow—Cast-Iron Pipes (110 tons of 18in.)
 London, E.C.—Steel Rails, &c.
 Harrogate—Ironwork at Kersnal
 London, E.C.—Steel Rails and Fishplates
 Buxton—Cast-Iron Water-Mains (4,000 lineal yards)
 Hornsey, N.—Cast-Iron Lamp Columns (100)
 Amsterdam—Tramway Rails (5,000 tons)
 Carlisle—Galvanised Wrought-Iron Tanks, &c. at Cemetery

Directors of W.V. Hampstead VerCo.	R. St. George, M.C.E.E., 17, Victoria-street, S.W.	July 27
Corporation	J. Young, C.E., Corporation Water Engineer, Town Buildings, Asst.	29
City of London	The Gasworks, City of London	30
New South Wales Government	The Agent-General for New South Wales, 9, Victoria-street, S.W.	31
Young's Collieries, Ltd.	Johnstone and Rankine, C.E., 288, West George-street, Glasgow	Aug. 1
City of London	City Offices, 25, Fenchurch-lane, E.C.4	2
Corporation	Robert J. Beale, A.R.I.B.A., 3, Broadway, Westminster, S.W.	10
City of London	Company's Office, 25, Fenchurch-lane, E.C.4	11
Urban District Council	Wm. Hedley Griers, Town Surveyor, Town Hall, Buxton	10
Urban District Council	J. Livermore, Engineer, 69, Southwark-street, Rotherhithe, S.E.	10
Joint Purvis Committee	The Director, Mutual Trusts, 10, Avenue-a-Marchant, No. 161, Amsterdam	Sept. 2
Joint Purvis Committee	Swiss Bank, Architect, 33, Lower-street, Carlisle	2

STORES

Dewbury - Gasworks and General Stores (One Year)

Hull - Redwood Paving Blocks 450,000

Woodbridge - Broken Granite (300 tons)

Leam-sham, S.E. - Road Material, Tar/Faving, &c. (Nine Months)

Leam-sham, S.E. - Broken Granite 1,300 tons

Leeds - Tar Macadam (1,680 square yards)

Kings-ton-on-Thames - Granite (100 tons)

Sheffield - Broken Granite (300 tons)

Levensham, S.E. - Portland Cement, Lime, &c. (Nine Months)

Brownhills - Broken Pebble Stones (One Year) *

(mostly - Stone (One Year)

Newmarket - Portland Cement

Sudgate - Highway Materials

Bishop's Stortford - Broken Granite (12,500 tons 2in.

Exmouth - Black Road Granite (500 tons)

(arrivages) - Broken Stones (1,000 tons 2in.

Tunworth - Broken Granite (3,000 tons)

Arleton - Broken Granite (2,000 tons)

London, E.C. - Steel Fishplates, Nuts, Pins, &c.

Lighting Committee	C. A. Craven, Gas Engineer, Gasworks, Savile Town, Dewsbury	July 27
Corporation	A. E. White, City Engineer, Town Hall, Hull	28
Urban District Council	W. G. Whistock, Surveyor, Woodlands, Epsom	29
Borough Council	The Surveyor's Office, Town Hall, Catford, S.E.	29
Urban District Council	The City Offices, Tintbridge Castle, Tintbridge	29
Urban District Council	The City Engineer's Office, Leeds	29
Guardians	Jan. Fellgate, Clerk, Union Office, Coombe Rd., Kingston-on-Thames	29
Urban District Council	The Surveyor's Office, Southam	29
Borough Council	The Surveyor's Office, Bedford, S.E.	29
Urban District Council	W. B. Chancellor, Surveyor, Public Buildings, Bromkhalms	29
Urban District Council	S. C. Dennis, Secretary, Epsom	29
Urban District Council	S. J. Zanlon, Clerk, Devas Chambers, Newark	Aug. 1
Urban District Council	L. F. Drake Brockman, Clerk, 88, Sandgate-road, Folkestone	2
Urban District Council	W. Catherall, Office, 10, St. John's, Bishop's Stortford	2
Urban District Council	Edward R. Capon, Surveyor, Brunley House, Church-street, Epsom	3
Urban District Council	J. H. Boyd, Clerk, 10, St. John's, Bishop's Stortford	3
Rural District Council	H. J. Clarkson, C.E., Surveyor, 29, Church-street, Tunworth	7
Urban District Council	A. R. Robinson, Surveyor, Town Hall, Clacton-on-Sea	7
Urban District Council	J. A. Young, Secretary, Epsom	7

CHIPS

Mr. William Corbett, of Amblecote Hall, Stourbridge, a partner in the fireclay firm of Messrs. Trotter, Haines, and Corbett, died on Friday, aged 69 years. He was a strenuous upholder of the interests of Amblecote, opposed its incorporation with neighbouring authorities, and at last was instrumental in getting it constituted an urban district, with an urban council of its own.

Mr. R. W. Johnson, M.D., inspector to the Local Government Board, held an inquiry at Normanton, near Wakefield, on Friday, relative to the application of the West Riding Council for sanction to borrow the sum of £2,000 for the purchase of a site of 9½ acres at Aekton, on which to erect an isolation hospital for the joint use of the townships of Normanton, Castleford, Whitwood, Featherstone, and Altofts.

A contract has been concluded between the Mersey Railway Company, which owns the tunnel railway between Liverpool and Birkenhead, and the British Westinghouse Electrical and Manufacturing Company for the construction of the works necessary to enable the Mersey Railway to be worked by electricity.

Alterations and additions are about to be carried out at Fulham Workhouse according to the designs of Mr. A. Saxton Snell, of 22, Southampton Buildings, Chancery-lane.

A new hospital for epilepsy and paralysis is in the course of erection in Maida Vale from the designs of Messrs. Young and Hall. The building is to be fireproof throughout on the Fawcett system. The builders are Messrs. Prestige and Co.

The tramways committee of the Leicester Corporation approved, on Wednesday, an arrangement for the purchase of the local tramways for a sum of £131,000. The corporation will not take over the actual working of the tramways until the end of the year. The present system of horse traction will be superseded by the overhead trolley electric traction at an estimated cost of £350,000.

A Select Committee of the House of Commons has passed the preamble of the Loch Leven Water Power Bill promoted by the British Aluminium Company, in which they seek powers to acquire certain lands and water rights at the head of Loch Leven, on the west coast of Scotland, in order to establish electrical energy works by means of water power.

A new roof is being put on the famous church of St. Monans, in Fifeshire, which dates from 1369.

At the last session of the Edinburgh Dean of Guild Court, a warrant was granted to the Governors of George Watson's Hospital to add boys' classrooms to the College in Archibald-place, from plans by Mr. Ross, of Edinburgh.

The Scarborough Marine Drive, which is in course of construction, and will connect the drives facing the North and South Bays, was inspected Friday Monday by members of the Institute of Civil Engineers and the York County students. The drive goes round the foot of Castle Hill, and, at the south end, 70 ft. above the water level, will be 100 ft. wide. The road will be 40 ft. and at one portion of it Castle Hill towers above to the height of over 200 ft.

At Clapton, on Saturday afternoon, the Countess of Shaftesbury laid the foundation-stone of a new parish-hall in connection with the church of St. James the Great.



NEW MUNICIPAL PALACE, PUEBLA, MEXICO.

The London Scottish Engineering Co., Ltd.



THE OBSERVATORY, WESTGATE-ON-SEA.

BANISTER FLETCHER AND SONS, ARCHITECTS.

The London Scottish Engraving Co., Ltd.



THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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MODEL BY-LAWS FOR RURAL DISTRICTS.

NOT long ago we referred to the proposals made to frame by-laws for buildings in rural districts. As we pointed out, rural district councils are not at present under any obligation to make by-laws, nor is it necessary they should be so thorough or of so structural a character as those of urban districts. Unless invested with urban powers under the Public Health Act, 1875, by the Local Government Board, no local authority could have done so till 1890? The authority to make by-laws for regulating new streets and buildings is conferred on the urban district councils by Section 157 of that Act and Section 23 of the Public Health Acts Amendment Act, 1890. A rural district council can obtain power by adopting Part III. of the Act of 1890, or make application to the Local Government Board to be invested with such powers as they deem suitable to the district, or to any one contributory placed within it. By-laws can be made on the following subjects: (1) The structure of walls and foundations of new buildings; for purposes of health; (2) the sufficiency of space about buildings to secure a free circulation of air; (3) the ventilation of buildings; (4) the drainage of buildings; (5) water-closets, earth-closets, privies, ashpits, and cesspools in connection with buildings; (6) the closing of buildings unfit for human habitation; (7) the structure of floors; (8) the height of rooms to be used for human habitation; (9) the keeping of water-closets supplied with sufficient water for flushing; (10) the alteration of buildings; (11) the observance and enforcement of such by-laws by requiring notices and fines.

From these subjects the Local Government Board have drawn up a series of by-laws suitable to rural districts, and chiefly referring to matters affecting health; but they leave to each rural council the responsibility of determining which by-laws are necessary to it, and the model by-laws issued are only intended to serve as a guide—not in any way, as excluding other provisions, should they be necessary. As the Board observes, "Portions of many rural districts are distinctly urban in character, and the development of building is constantly changing the aspect of the country, and it devolves on rural district councils to endeavour to apply to the several parts of their districts such regulations as the circumstances may, from time to time, seem to require." As to matters like stability, prevention of fire, and width of streets, these are chiefly of importance in urban districts, but may be extended to the denser parts of rural localities; in short, it is pointed out that where more comprehensive by-laws are necessary, the rural district council may adopt them from those in force in urban districts.

We can only glance now at the scope of the by-laws as applied to rural districts. Attention may be directed to the definition of "domestic buildings," which means a "dwelling-house or an office building, or other outbuilding appurtenant to a dwelling-house, whether attached thereto or not, or a shop or any other building not being a public building, or of the workhouse class." This definition would therefore include kitchen offices, conservatories, summer-houses, stables, cowhouses, sheds, and many other kinds of structures attached to the house or not, whereas "dwelling-house" is made to apply only to a building used or constructed,

or adapted to be used principally for human habitation. It may be noticed also that one subdivision under "Exempted Buildings" will operate to exclude all buildings not dwelling-houses, or "used wholly or partly for human habitation, or as a place of habitual employment of any person in any manufacture, trade, or business, and which if intended for use as a pigsty or a cowhouse shall be detached from any dwelling-house." Thus, it is stated, "buildings for agricultural purposes and outbuildings, such as plant-houses, orchard-houses, summer-houses, tool or poultry-houses are unrestricted, except that they should not encroach on the open space required for new domestic buildings under by-laws 6 and 7." Thus pigsties and cowsheds, if not detached from a dwelling-house, are not exempted, and the only object of the rule is, as stated, to discourage such structures in contact with dwelling-houses as dangerous to health. The same clause includes public buildings and warehouse buildings within the operation of the by-laws, but the provisions are limited.

The clauses relating to the structure of walls and foundations of new buildings for purposes of health, 3 to 5, include provisions for securing dryness of ground beneath domestic buildings: by asphalt or cement concrete 6 in. thick, and preventing the admission of impure ground air from the soil; but this clause only applies where the dampness of the site or soil renders it desirable; also for a proper drainage course of sheet-drain, apertures, or slates in cement, &c. for a double wall with cavity of 2 in. to any part of the lowest story of a building below surface of the ground. The same walls to be tied together by ties of iron tarred and sanded, galvanised iron, or vitrified stoneware; and also for coping or protecting parapets above roofs or gutters so as to prevent water soaking into such wall. These provisions, it will be seen, only affect the dryness and sanitary conditions of walls and foundations, and do not apply to structural matters as to materials, size, and strength, the builder being left quite free in these respects. Clauses 6 to 7 deal with the provision of space about buildings to secure a fair circulation of air, a very necessary condition even for buildings in country districts. Clause 6, as it reads, is somewhat ambiguous in its phrasing, and we think might have been made a little more explicit. We quote it in full: "Every person who shall erect a new domestic building shall provide in front of such building an open space, which, measured to the boundary of any lands or premises immediately opposite, or to the opposite side of any street which may not be less than 24 ft. in width where such building may front thereon, shall, throughout the whole frontage of such building, extend to a distance of 24 ft. at the least, the said distance being measured in every case at right angles to the external face of any wall of such building which shall front or abut on such open space. Where a new domestic building may be intended to front on a street laid out before the confirmation of these by-laws, and of a less width than 24 ft., the person who shall erect such building shall provide in front thereof an open space, which, measured to the opposite side of the street, throughout the whole line of frontage of such building, shall extend to a distance equal, at least, to the width of such street, together with one-half of the difference between such width and 24 ft." These clauses mean practically that where a house is built fronting to an existing street less than 24 ft. in width, it is to stand 12 ft. from the centre line of street, making an adjustment between the opposite owners. A diagram explanatory of the clause would assist the mind. Thus, in a street, say 20 ft. wide, the builder on one side would have to provide in front of his house $20 \div 2 = 22$ ft., the opposite building, or 12 ft. from centre line of

street. Such open space is to be free from any erection above level of ground, except any portico, porch, step, or any gate, wall, or fence not exceeding 7 ft. in height. Clause 7 is important also, referring to open space in the rear of building; such space is to be exclusively belonging to such building, and "to be of an aggregate extent of not less than 150 sq. ft., and free from any erection thereon above level of ground, except a water-closet, earth closet, or privy, and an ashpit," such space to extend laterally throughout the width of building, and the width of wall space to be not less than 15 ft. in any case. If the height of building be 25 ft., the distance is to be 20 ft. at the least; if it is 35 ft. or more, the distance to be 25 ft. at the least. The height of building to be measured from level of ground of open space to the level of half the vertical height of the roof or to top of parapet, whichever may be the higher. If the house adjoins a park, such provision would not be necessary or compulsory. Clauses 8 to 12 deal with the ventilation of buildings; but these refer to the provision of "a sufficient number of suitable windows," each affording direct communication with the external air, and do not impose any serious restrictions. The window, or windows, of every habitable room to have an area clear of the frames of at least one-tenth of the floor area of such room; half the window to be made to open at the top; a clear space of 3 in. at the level of the top of the window, the underside of every joist on the lowest story if the ground be covered with asphalt or concrete, and of 9 in. at the least if the ground is not so covered, and such space to be ventilated by air-bricks. It is also provided (Clause 11) that every habitable room without a fireplace and due to be ventilated by an air-shaft having a clear sectional area of 50 sq. in. at least. These provisions are very desirable in the country where one sees houses and cottages without fireplaces and flues, and no effort to secure a free current of air under ground floors. No one can object to the minimum requirements proposed. As regards the space under floor joists, ground floors, we think 9 in. should be the least.

The drainage of buildings is provided for in Clauses 13 to 19. It is impossible for us to enumerate the several clauses. Provision is made that the subsoil of new buildings be properly drained by earthenware field-pipes in damp soils; that the lowest story of new buildings is to be constructed at such a level as to facilitate its being drained into any sewer; that glazed stoneware pipes be used of adequate size, and to be not less in diameter than 4 in., and to be laid in a bed of concrete with proper fall and with proper jointing; that no drain is to pass under any building where it is avoidable; if it is so laid, it is to be laid in a direct line, and to be imbedded all round with cement concrete 6 in. thick, with means of access at each end; that inlets not used for ventilation to be properly trapped; that suitable traps be provided to drains communicating with any sewer, but at proper distances from the building; that for ventilation two untrapped openings to drains be made, one as near as practicable to the trap between main drain and sewer, and the second opening as far distant as possible from it; one of these to be at or near the level of ground adjoining such opening, communicating with the drains by means of a suitable pipe-shaft or disconnecting chamber, the other opening to be carried up as a pipe to such a height as to prevent any escape of foul air into any building, or a soil-pipe may be used if of proper situation and section, &c.; that suitable gratings to such openings be provided. Other clauses relate to the size necessary for pipes or shafts, bends, and other details. Where there is no water-closet within the building connected with the drain, and the latter is not more than 20 ft. in length, and where the aggregate

stately dignity sits facing the Mall in the front of the central composition, which is surmounted by a winged figure of Victory, with supporting statues of Constancy and Courage at her feet. Justice and Truth group right and left of the column; behind is Clarity of Love, a large figure symbolising Maternity facing the Palace. The statues are to be executed in bronze, that of Queen Victoria being of heroic size. The pedestal and other parts are intended to be in Portland stone. The cost of the portion agreed to is stated at £200,000. Of the details of the design we cannot form an adequate opinion from so small a sketch, and Mr. Webb's work, too, is to be considerably modified in this respect. The idea of an iron grille, such as Lord Escher spoke of, in lieu of Mr. Webb's colonnade, does not commend itself to our judgment, and we hope that nothing small and inconsequential will be permitted; for what is intended is an eminently dignified and well-proportioned composition of large scale and simple detail depending on well-conceived outlines rather than elaboration of its individual parts. It must be of sufficient scale to hold its own in juxtaposition with the Palace, which by its mere bulk will tend to destroy the size of the intended work if the governing principle which we have suggested is in any way ignored.

NATIONAL COMPETITION DESIGNS AND DRAWINGS.

THE Exhibition of Designs and Works now open at South Kensington shows an advance in the quality of certain subjects of design. All the works are certified as having been done as school works within the last preceding school year. We need not give the figures relating to the number of schools of art, branch schools, and science and art classes, but of these 6,902 works are entered for national competition. Twelve gold medals have been awarded, one for measured drawings of the Priory Church, Great Malvern, by Garnet J. Hands of that town; one to a Liverpool pupil, Michael, Annie McLeish, for designs for the decoration of a small chamber—organ; one to G. W. Barber, of Macclesfield, for decorative panels; and one to F. E. Collington, of Nottingham, for measured drawings of All Saints Church, Hawton; and the other gold medals are given to the students of the Aberdeen, Birmingham, Battersea, Blackheath, Glasgow, Plymouth, and Walthamstow schools; but this year not one medal of this class goes for any architectural design, which are confessedly rather "below the average" to use the words of the examiners, Mr. Reginald Blomfield and Mr. F. G. Jackson, R.A. Not that this award is always an indication of high merit;—certainly not, for we have seen many very indifferent designs honoured with this distinction. The fact rather shows that a higher standard of merit is expected of designers than formerly; that whereas some years ago draughtsmanship and trickiness of execution had some weight, more attention is now paid to honest planning and a more thorough acquaintance with construction. The technical schools of the Arts and Crafts have had some influence in this direction. Instead of over-elaboration of detail based on traditional teaching of styles, we find a desire to study the actual facts of building in a simple and direct manner, as we see in such designs as those for a provincial market hall, a school of art, one of the designs for a water tower, and the design for a small town house. Still, there is prevalent in many cases a desire for ambitious subjects and elaboration—a love for academical treatment where more common-sense requirements would be better, and we are glad to find the examiners have pointed out that a great deal of labour is wasted on what is immaterial, in elaborate reproduc-

tions of jointing and tiling, and other mechanical detail. The attempt to show everything, even the courses of masonry, and to outline details and ornament however insignificant, is a fault that we have mentioned more than once. When once we begin to see draughtsmanship used only subjectively, to explain, not to transcend, the thought of the designer, we shall have more hope. At present the drawing runs away with, instead of being made subordinate to, the design.

The design for an entrance to a public park, by Charles J. Menart, of Perth, receives a silver medal, and no doubt worthily, for the ability shown in the composition and the drawing of the sculptured parts, though rather pretentious and academical. The author overtaxes his ingenuity in making the double quadrant of columns on the park side, without, as it seems, adding to the effectiveness. The plan shows a road and a bridge approach over a river, with three passages, the outer for carriages and the centre one for equestrians. The proportion of the two orders of columns is not quite satisfactory. A section through the archway shows a domical roof. Over the quadrant colonnades is a sculptured frieze. The treatment of the quadrant by the straight extension is not desirable. The elevation to the park is dignified, and the large scale drawing of end wing, with its broken pediment and sculpture, is freely drawn, and displays ability, though not faultless in detail.

A well-balanced, ambitious design, by Alfred C. Bosson, of the Polytechnic School, Regent-street, for a town-hall, is awarded a bronze medal for its general conception. As a design for a provincial town it is very pretentious and elaborate in detail; the corner cupolas over angle pavilions are too ornate in character, and, despite much bold drawing, the author exhibits many errors of design and detail, as in the corbelled window columns, the enormous keystone to apex of corner pediments, and the way the arches in the pavilions spring, as pointed out by the examiners. There is a well-proportioned central tower, the whole is conceived in a florid Italian Renaissance style, and the plan is not without merit. The sections and detail drawings are well executed in a mastery style. The other design, described as that of Frank Jones, of Scarborough, receives also the same prize; but as we did not see it we cannot offer any remarks. The examiners describe the style as "affected," and the ornament "out of proportion." We presume they refer to the same subject, but do not say so. Mention is made also of Ernest G. Harrison's design (bronze medal); but this also was unhelpful. It is a pity these designs were not exhibited, to enable a comparison to be made by members of the public. Other designs are also mentioned by the examiners and criticised; but we did not see them on the walls, and are therefore unable to notice them.

A bronze medal is awarded to C. Gascoyne, of Nottingham, for a design for a memorial hall and institute; a bold, thick-lined set of drawings, displaying knowledge of detail and composition, though rather wanting in general outline. The style is a Free Classic Renaissance, and the front perspective shows the entrance to a large scale, with coupled ionic columns, and a circular pediment flanked by columnar towers crowned by cupolas, has some boldness. The details of tower and wings and the carved work below window-sills are more clever than suitable. The same medal goes to Ernest G. Harrison, of Birmingham Municipal School of Art, for design for a school of art. The plan is well studied, and good lighting to the schoolrooms obtained. The author shows a careful attention to the roofs and glass skylights to architectural room, and the details of elevation are masterly. We consider this on the whole one of the most practical sets, and the draw-

ings are firm and clear. Albert Pitcher, of Worcester, receives a bronze medal for a design for a provincial market-hall, conceived in a plain, suitable Classic, with tower and cupola at one end over entrance-hall, with side staircase leading over the market-hall to an assembly-room with platform, &c. The plan shows a practical conception of a building of this kind, and the drawings and details are well executed. Some character and effect are given by the projecting corners, with their broken pediment ends and order. Another design of similar character comes from A. G. Parker, of the same school, and receives a book prize. A bronze medal is awarded to F. G. Daniel, of Nottingham school, for design for a small town house; the plan has been well studied, with a side area in centre lighting the staircase and landing. This is a sensible and suitable design, and well shown. Frank Jones, of Scarborough, receives the same prize for a design for an artist's country house. The plan and treatment are picturesque in a Late Domestic Gothic style; there is an ink perspective and coloured elevations, and details of woodwork. The design for library and picture-gallery by James G. Shearer, Dunfermline, is refined in treatment; the upper gallery story is quite plain externally, and the plan and details show consideration. The detail and the keystone in pediment are rather thin. A bronze medal is given.

James McIntyre, Glasgow, is also the recipient of a bronze medal for a water-tower, a subject that has been badly treated. The proportions are good, but the entrance is scarcely massive enough for the masonry. The octagonal projecting tower on the upper stage and the gallery make pleasing features. The tower is slightly battered. The other design, by G. Stewart, is too like a church tower. James Hepburn, of Glasgow, and Alan J. McNaughten, of the same school, also send designs not exhibited. We must also notice a design for a mausoleum (book prize) by Robert M. McKissack, of Glasgow Technical College, in a severe and direct Egyptian style, in some degree refined in proportions and details; but why should this subject so invariably be selected in preference to more everyday buildings? The Glasgow students are naturally imbued with the dignity and refined grace of a style which is so prominent in their midst, and to this cause we must attribute the regard they show for it. Another book prize is given to George M. Stewart, of the same school, for design for a mural fountain. The idea is suitable, though perhaps a little suggestive of an entrance porch. Fountains against walls are difficult subjects to treat with any freshness, and the niche and the pediment are generally adopted in some form, or another. Bryant A. Poulter, of Reading, receives a bronze medal for a set of drawings for a country house and for a design for a wayside inn. These show care; but, as the examiners point out, the court in the former is not wide enough for carriages to turn, and the towers and angle turrets are useless in the latter.

We may now briefly refer to some of the designs for internal decoration, stained glass, and metal-work. These are hung in rather a bewildering manner, and it is a pity some more definite plan of arranging the designs in subjects 23 c. and 24 c. is adopted. We now proceed to the designs for ornamental metal work. Amongst these we see one or two clever designs for processional crosses, one in silver and enamel, by Gwendoline Watts, New Cross, for which a silver medal is given. There is a metal treatment, the enamel at the crossing of the arms forming a pleasing kind of nimbus. The centre of cross is enriched by five arabesques. The enamelled centre is well studied. The other designs (bronze medals), by Maud Avery and Lilian Field, are in silver gilt and red and blue. A bronze medal is given for a *repoussé* plaque of beaten copper, with executed specimen. The New

Three Small designs are important contributions in the class of work. The artist has a happy taste, and exhibit much technical dexterity of detail. Kate Allen's design for a mirror in silver and enamel is very elegant in outline, and we must notice with commendation the work of E. May Brown, Evelyn Hewitt, Dorothy M. Snow, Edith Studdings, Geraldine Watts, Josephine Riversdale, amongst others who have done excellent work, all taking bronze medals.

The decorative schemes rather affect simplicity. A scheme of decoration for a living-room, by Winifred Horton, of Liverpool, deserves notice. It has a painted frieze, a design of water lilies, simple and restrained, and delicate in colour; the pattern consists of a succession of Vitruvian-like scrolls, and forming a band round the room level with the upper part of doors, a little more than half the height of wall. It is awarded a bronze medal. The scheme is rather meagre for a room of this kind. A silver medal is given to Roland Barker, Leicester, for a series of designs for a dining-room; the architectural effect of the treatment is unsatisfactory. The walls are strewn with puce, the frieze is stencilled, the oak woodwork stained green, and the furniture enriched with stencil ornament and pierced opaque copper. The scheme of colour in a green tone is quiet and in harmony. The same medal is awarded to Miss transyue Nottingham for the decoration of a nursery, a very clever set with a central perspective interior; there are painted red hinges to doors, and stencil decoration to arches and ceiling. Lillian Packer, Regent-street Polytechnic, takes a silver medal for designs for painted panels of a sideboard, very clever and harmonious in colour; and David Baxter, Liverpool, for decoration of a music cabinet. The same award is given to Jessie Kilpin, Leeds, for design for stained oak and coloured glass windows, a scheme of merit and refinement.

A fine sense of decorative arrangement and colour is shown in Annie McLeish's (Liverpool) designs for the decoration of a chamber organ, which takes the only gold medal for this subject. The conception and arrangement of the figures and the colour are admirable, though the drawing of one figure is faulty. For a similar class of work David A. Baxter, Liverpool, is awarded a silver medal for the decoration of a music cabinet, clever and harmonious in treatment and colour. The same prize is given to George Burrows, Dudley, for decoration of room, but the panel treatment is rather monotonous.

Several other designs for panels and friezes are seen, and in these there is much clever adaptation and feeling for line, though the colour schemes often exhibit a want of study in colour harmony. Stencilled ornament is scarce in several examples. We can only notice in passing a stencilled frieze for night nursery, clever in conception and drawing, by Florence Liverpool, Liverpool; silver medal. A design for a square wood post and capital, carved in oak, showing a pleasing treatment to the upper part of the novel, and to the base by W. H. Wilkinson, Leeds, (silver medal). Hilda Myers' design for folding screen, decorated in stencil and embossed punch, with excellent panel showing the geometric ornament of wood framing (bronze medal). The designs for stained glass are above the average, and show a keener appreciation of arrangement of leading and colour. Pot-metal is chiefly noticeable in these designs. The gold medal is given to Geraldine Morris, Birmingham Municipal School, for a series of clever designs, illustrating "Hyla and the Water Nymph," prettily conceived and well-headed. The full-length cartoon shows good arrangement of the figures, swishes of the ether, series of pools illustrating the Wiles, the colour being very agreeable. May G. Cooksey,

of Liverpool, takes a silver medal for a cleverly arranged circular window, also to Alex. J. Tanner, Glasgow. Other bronze medal designs we notice include one by Kate M. Kodie, Birmingham, for design representing figure of "Circe"; stained glass for schoolroom of private house by Roberta Glasgow, Liverpool, representing "Spring," with four lights, is harmonious in colour; a stained glass window with figures of St. Agnes and St. Ursula, both nice colour schemes, the first by Eustace Richards, Nottingham, which takes a silver medal, and the latter by Alice Horton, Liverpool (bronze medal).

The designs for tiles and pottery exhibit a more rational treatment of the material. The gold medal is given to G. W. Barber, of Macclesfield, for two tile panels treated decoratively. The design in which storks and foliage are conventionally arranged is somewhat crowded, but the colour is good; a silver medal is awarded to Rowland Hill, of Manchester, for a design for 6in. pressed glazed wall tile. The plaster casts and the specimen tiles exhibited are simple, and show a proper adaptation of material and nice colour. The designs for raised line majolica tiles by James A. Harrison also take this prize. We also notice a clever design (bronze medal) for mantelpiece, showing painted tile panels—a peacock and its plumage forming a rich scheme of colour, by "Clas. H. Smith, Bradford Technical School. A few clever adaptations of design to plaques are shown. We notice a bronze medal design by Edwin Tenson, Stoke-on-Trent, having a nice border arrangement, also some designs by Margaret Thompson, of New Cross, showing cleverness.

Stencilled hangings and wall-papers are not remarkable, perhaps owing to the greater care and restraint imposed. In some of the designs a striving after originality is one cause of failure, and in wall-papers there are designs of any merit. Ross K. Warner, Holloway, has a novel design for stencilled hanging, is well adapted for a church; the limits of stencil work are kept in view. The design introduces figures of saints carrying the emblems of the Passion. Another medal goes to Ethel E. Smith, Nottingham, for a tapestry hanging with pomegranate and foliage on a blue ground, and we see a nice stencilled design for mantel-board and curtains by Edith A. Jones, of Cambridge. If wall-paper we may notice as meritorious Annie W. Morton's (Edinburgh) design, a good adaptation, Edith Leworthy's (New Cross) design showing good arrangement, and A. Kidd's Sunderland hanging and frieze all take bronze medals. A few bold designs for wall-paper, by John Potter, Derby, receive a silver medal. We may also notice a clever design for stencilled hanging by John F. Ison, Chelsea, done on canvas, showing the limits of the process observed, and a clever worked portiere by Jessie Cook, Chelsea. These textiles is another important branch of design. They indicate a greater regard for the limitations of the material and manufacture and technical qualities. A Glasgow student, Lizzy G. Naismith, has a clever design for wool tapestry, with heraldic devices introduced; the scheme of planning in zigzag or chevron lines is well introduced, and the colour of ground green. It is awarded a silver medal. We notice also Robert Gilchrist's (Glasgow) design for a rug, in which technical qualities have been observed, for which a gold medal is awarded. A design for a stair carpet, by W. Anderson, another Glasgow student, shows a different pattern to head and riser. A silver medal also goes to a Bradford student for a chaise design for printed silk, and generally the designs for printed textiles show a higher sense of the material and treatment required, as in Nos. 101 and 1191. The embroidery hanging by Mabel B. Kightly, Plymouth is refined

in scheme, and the student shows considerable skill in deftness in the stitches, imparting texture and colour to the work. It takes the gold medal.

The designs for iron and metal work are few, and not remarkable for any merit. For example, the scheme for a chancel screen, by E. A. Hewitt, New Cross, has the merit of extreme, perhaps affected, simplicity; it is clever, but the technical qualities are not so evident. The design for a sign for an inn, by J. Savage, Hounslow, in wrought iron, is clever. The motive is a swan, which would have been better in copper than iron. The silver medal is given to Stroud Thompson, of New Cross, for a design for a lectern in cast bronze. The drawings show some skill in the treatment of the material and details, though it leaves much to be desired. Design for electric fittings by Frank Ford, of Maidenhead, is scarcely suitable for wrought iron. Bronze medals also are given to Dorothy M. Snow, of New Cross, and to Thos. Wright, of Birmingham, for a wrought-iron stand. In some of these designs the students have not adapted the material in quite the right spirit.

The modelled designs are not distinguished for any originality, and one can only mention a few of the principal works. The authors have not in all cases named the material, so essential to a right motive and treatment. That for an armoury doorway by Jas. Huck, Glasgow, has vigour, and deserves a higher award than a bronze medal, while we can hardly say the architectural merit of the modelled chimney-piece for which a silver medal is awarded. The supporting bronze colonnettes are small and out of proportion to the heavy mantel. It is intended by the student, Beatrice Moss-Every, to be in Sicilian marble; the upper part is better. A plaster panel by Winifred L. Stamp, Regent-street Polytechnic, in low relief is refined. A silver medal also goes to a panel with figures by Alfred Watson, Birmingham, a design for a bronze model, by David H. Hodge, Plymouth, who also sends one for a rural fountain, deserve notice; both take bronze medals. In a case we see a modelled design for a silver butter-dish, which is suitable for the material (silver metal); in other cases, as in a plaque surmounting a hospital doorway, the architecture is weak, and this is a general fault in the designs which unite the two arts of sculpture and architecture. A few chandeliers and pieces of jewelry are shown in a case, but they are more or less faulty. In the modelling designs or time exercises, we see a few clever ideas: the bracket and the casket for a niche are meritorious; but the other work is of an indifferent kind. It is a fault of our art teaching that modelling as an exercise is not more studied. The influence of types has a great deal to do with the lack of individual and unaided effort, such as these impromptu exercises afford.

Several measured architectural drawings are on view, and the opinion of the examiners—J. Belcher, A.R.A., T. G. Jackson, R.A., and J. J. Stevenson, is that the quality of the work in this class is much higher than in former years. No doubt there has been a more careful selection of subjects; but there is still, we think, room for improvement. The gold medal is awarded to Garnet J. Hands, of Great Malvern, for a set of very finely executed and carefully measured drawings of the priory church of Great Malvern. The lines are neat and firm, and a good ink perspective of the church from the south-east is sent. A gold medal is also given to Fred. E. Collington, of Nottingham, for drawings of the Chancel of All Saints Church, Hawton, Notts, and details of the doorway and sedilia and the rich carving to eastern sepulchre. The drawing of this part has been plotted on the spot, and exhibits immense labour in the detail of this work. Albert Pitcher receives a silver

model for special view of buildings of several old churches, &c., and measured drawings of the Priory Church of Great Malvern—a careful set. The same price is given to Lawrence L. Bright, Nottingham, for some bold measured drawings of Kirby Hall; and also to Harry Phibbs, Birmingham, for drawings of the tower of St. Giles Church, Wrexham, accompanied by a pencil perspective—a masterly drawing of detail of this Late elaborate tower; also for drawings of Westwood House, Worcestershire, a fine Elizabethan mansion of good character. Bronze models are taken for elevations and details of east front of Nottingham Castle, an interesting example of the contemporary style of Wren and Inigo Jones, by John E. Richardson, Nottingham; for drawings of the Custom House, King's Lynn; of Winchester College Chantry Chapel, by Arthur H. Johnson; of St. Nicholas Church, Worcester, an 18th-century example of Classic, by W. Thomasson, of that city. Drawings and sketches of a few provincial market halls, by Alfred G. Parker, of Worcester, an interesting series of stone and half-timber examples receive a book price. Drawings of Dunblane Cathedral, by John A. Wilson, Glasgow, and of Glasgow Cathedral by M. L. Paterson, of that city, may be mentioned also. Space leaves us no room to refer to works from the Antique—modelling, drapery, ornament, studies from the living model painting in oil and water colours, which indicate improvement in some qualities.

HOW TO ESTIMATE: OR, THE ANALYSIS OF BUILDERS' PRICES.—XVII.

By JOHN T. REA, F.S.I., Surveyor, War Dept.

SLATER'S MEMORANDA.

Names.	Size.	Gauge for 3in. Lap nailed in centre.			Gauge for 3in. Lap nailed in centre.			No. of Squares covered by 1200.	Weight of 1200.	First Square per Square.	Nails required per square.
		in.	in.	in.	in.	in.	in.				
Singles	12 x 8 4 1/2	4	3	15	4	3	15	400	6	300	5
Doubles	12 x 8 5 1/2	4	3	15	4	3	15	380	6	290	5
Ladies	16 x 8 5 1/2	4	3	20	4	3	20	350	6	260	5
Viscountesses	18 x 10 7 1/2	4	3	25	4	3	25	320	6	230	5
Countesses	22 x 10 7 1/2	4	3	30	4	3	30	300	6	210	5
Mar- chionesses.	22 x 11 9 1/2	4	3	35	4	3	35	270	6	180	5
Duchesses	24 x 12 10 1/2	4	3	40	4	3	40	250	6	160	5
Princesses	24 x 13 10 1/2	4	3	45	4	3	45	230	6	140	5
Emperesses	28 x 16 11 1/2	4	3	55	4	3	55	180	6	110	5
Imperials	36 x 24 13 1/2	4	3	70	4	3	70	140	6	90	5
Queens	36 x 24 16 1/2	4	3	80	4	3	80	120	6	80	5
Emper's	36 x 24 16 1/2	4	3	80	4	3	80	120	6	80	5

A.—Squares covered by 1 ton.

The above sizes sometimes slightly vary, according to the quarry.

Slates are classed according to their straightness, smoothness of surface, fair even thickness, absence or absence of discoloration, &c. They are generally divided into first and second qualities, and in some cases a medium quality is noted. Slates of first quality are thinner and lighter than those of inferior quality.

Rule to find the number of slates required to cover one square: One square in inches ÷ width of slate in inches × gauge in inches,

The weight of slating on roofs is 8lb. per foot super. for all sizes, except ruge or queens, including a 3in. lap and nails.

As there are two nails per slate, the number required per square will be found by doubling the number of slates. The trade "Thousand," or "long tally," equals 1,200 for buying and selling.

SLATE SLATES.

8ft. super.	in.	ton	lb.
3 thick, weight 1 and 1 ft. super, weights	12	1	15
" " " " " " " "	16	1	15
" " " " " " " "	20	1	15
" " " " " " " "	24	1	15
" " " " " " " "	28	1	15
" " " " " " " "	32	1	15

These slates to be of best Bangor, or others of equal quality or value, with 3in. lap, and two nails to each slate.

Ladies laid complete (exclusive of boarding and battening), with composition nails		s. d.
Complete ditto ditto	per square	25 1
Duchess ditto ditto	per square	33 4
Add to fore edge 1/2 in. wings, plain lead ordered, for every in. beyond the 3in. lap		2 0
Add to sliding if drilled and countersunk		1 6
Add for torching or pointing on the underside with hair mortar when laid on laths or open battens		2 7
Ditto if tiled together with lime and hair mortar against underside		4 0
Slating of any kind, stripped and piled at the foot of the building, or in store, including removal of old battens		2 6
Old slating dressed and relaid complete, with iron nails (labour and nails only)		7 0
Slate damp-proof course of Countess or Duchess slates, set in cement, double corner breaking joint	per foot super.	0 6
Filling with hair mortar	per foot run	0 11
Ditto with Portland cement	per foot run	0 2
Ridge or hip tile, 7in. wings, plain lead joints, ferro-metallic blue, red, or buff, set in hair mortar and pointed with cement		0 73
Ditto with raised roll, and ditto		0 11
Add to last two items if set in cement		0 2
" Thomas' patent ridge, 3in. roll, with 3in. wings, and set in cement		2 4
" William's patent slate ridge, with copper dowels and screws, 3in. roll and 7in. sides, in lengths of not less than 4ft., supplied only		1 10
Add if fixed, including bedding in hair mortar and pointing with cement		0 4
Extra for cutting to hips, valleys, and waste		0 2
Ditto to eaves ditto		0 3
Galvanised iron hip hooks and fixed	each	1 6
Make good slating top-pipe passing through roof		2 0

SLATE MASONRY.

Slate fittings to shelves, lavatories, urinals, cisterns, &c., of Bangor or other of equal quality, sawn or cut to any size required.

Description.	Thickness.		
	3in.	4in.	5in.
	s. d.	s. d.	s. d.
Slabs, quarry planed or split-faced, obtained by splitting—under light, super, supplied only	per foot super.	0 11	1 1 1 3
Ditto, from 16 to 30ft. super.		1 0	1 3 1 6
Setting slabs of any size in mortar		0 2	0 2 0 2
Add to last if fixed in Portland cement		0 2	0 2 0 2
Add to first two items if fixed, including 1/2 in. drift, and countersinking		0 2	0 2 0 2
Add to slabs if planed and set in mortar		0 1	0 1 1 0 3
Add to last if fixed in rubble, and ditto		0 2	0 2 0 2
Add if cancelled each side, white or green		1 0	1 0 1 0
Enamelling plain edges, white or green	per foot run	0 3 1/2	0 4 0 4
Chamfering from 1 1/2 in. to 2 1/2 in., and rubbing		0 13	0 13 0 13
Ditto ditto, circular		0 3	0 3 0 3
Circular cutting		0 23	0 4 0 4
Edges sawn		0 11	0 11 0 11
Ditto ditto		0 3	0 3 0 3
Ditto circular		0 2	0 2 0 2 1/2
Grooving up to 1 1/2 in. girth		0 33	0 48 0 48
Rounded nosings		0 23	0 23 0 23
Ditto ditto circular		0 31	0 4 0 5
Corners rounded, plain, up to 3in. girth		0 13	0 2 0 2 1/2
Ditto ditto, circular		0 21	0 3 0 3 1/2
Throating		0 1	0 13 0 13
Ditto circular		0 13	0 13 0 13
Corners rounded, plain, up to 3in. girth	each	0 23	0 4 0 6
Holes drilled and countersunk up to 1 1/2 in. diameter		0 1	0 13 0 13
Ditto ditto from 1 1/2 in. to 3in. diameter		0 22	0 33 0 43
Holes for baying		0 2	0 2 3 2 6
Holes drilled for countersunk or tapped for screws	per dozen	1 2	1 4 1 6
Screws, copper, strong, 2in. for fixing slate fittings, S.O.		0 10	0 10 0 10
Partitions and slabs taken down and removed	per foot super.	0 1	0 1 0 1

Slate channel course for urinals, &c. 3in. × 3in. with semicircular 3in. channel, dashed to current and set in cement		s. d.
Labour only in sinking 3in. channel, with current in deep		0 5
Slate skirting, 6in. × 3in. planed O.S., chamfered and fixed with screws	each	1 0
Stop-ends to channels, labour only		0 1
Ditto to channels, grooves, &c.		0 1
Cutting holes in slate channels 3in. thick, one being for water		2 0
Mortises or nail holes up to 1 1/2 in. deep		0 4

Slate eastern, 3in. thick, delivered and fixed	£ s. d.
complete	120 gallons each
" " " " " "	200
" " " " " "	230
" " " " " "	300

WELSH SLATES AND LATHS.

Cement, oil		s. d.
Cement, red lead	1 lb. bushel	4 2
Oil putty	Counters	2 10
Clips, strap, for slates, 6 in. x 1/2 in.		1 6
" " " " " "		1 6
Nail, slating, composition		0 7
" " " " " "		0 7
" " " " " "		1 2
Painted		0 5
Nails, slating, zinc		0 7
Cement, Portland	1 lb. bushel	1 10
Hair mortar	per foot super.	0 73

WESTMORELAND SLATES.

Slates, first quality Bangor, delivered in London, Singles		£ s. d.
" " " " " "	per 1,200	3 2 0
" " " " " "		3 10 0
" " " " " "		3 13 0
" " " " " "		8 10 0
" " " " " "		11 0 0
" " " " " "		13 10 0
" " " " " "		15 10 0
" " " " " "		18 10 0

THE RAILWAY RATE TO LONDON IS 16s. 8d. per ton. Five per cent. discount is allowed of the prices quoted in Coniston.

Wages, slater's		s. d.
" boy's	per hour	0 11
" " " " " "		0 3 1/2

ANALYSIS.

Slates.—The great bulk of slates come from North Wales, and may be roughly divided into three classes most in use for ordinary work:—"Bangor" (chiefly from Lord Penrhyn's quarries at Bethesda, and the Dinorw or Velinor quarries, which are working at opposite ends of the same slate vein running N.E. and S.W.);—"Port Madoc" (from the Oakley Slate Quarries Co. at Festiniog; and "Carnarvon" (from Llanberis, Nantlle, and other places from eight to twelve miles distant). These slates are generally blue. It will be observed that the slates are taken from the ports at which the slates are collected for sale and exportation.

Green slates come from Whitland Abbey near Narberth, Pembrokeshire, and Westmoreland (The Tiberthwaite Green Slate Co., Kendal), as well as from Cumberland (Buttermere, the quarries in Honister Pass) and Lancashire (Coniston). Westmoreland slates are always sold by the ton, and have different nomenclature and irregular sizes from Welsh slates. When laid, the courses are not uniform in depth, but diminish towards the ridge.

Other slates come from Cornwall, from the Old Delnole quarries, near Camelford, Leicester-shire, Rutlandshire, Northamptonshire, &c., also yield slates. Of late years, a great many have been imported from the United States, chiefly because of the long strike among the Welsh quarrymen, and American slates are becoming more and more popular. The special rates in this country is 9s. per 1,000 cheaper than the best Welsh qualities.

The very large slates, such as Imperials, Rugs, and Queens, are called "Ton or weight slates," being sold by weight; while the other sizes are called "Count or tally slates," being sold by number.

The trade "thousand," or "long tally" equals 1,200 for buying and selling; but, allowing 5 per cent. for breakages, 1,200 are put into the trucks at the quarry. Small numbers are sold by the 100. In London, slates are frequently sub-sold by the contractor. The special rates of the railway companies are for not less than 4-ton loads, and they carry by actual, not computed, weights.—Composition nails are best of all good

work, as they are stiff and tough. They cost from 1s. 6d. to 1s. 7d. per square. Copper nails are either cast or rolled. The latter are soft and cheap, but they are not frequently used, despite the fact that they are not so much affected by rust as the former. They are also lighter in weight. Cast iron nails are used for temporary work, but they are very soft, and they are not used for permanent work. They are also very cheap, but they are not used for permanent work.

All the above are sold by weight, and the price is usually estimated at 2s. per thousand. But if a slating machine is used a smart boy, at 10c. per hour, will be able to hole from 300 to 400 slates in an hour, equivalent to 1s. per thousand.

The following statement shows the labour required per square, which will be less for larger surfaces, as slating will be performed more rapidly. The difference in time for the various kinds represents the extra trouble in handling, and the labour in covering with larger slates in a given time, and the labour in holding is the same for all sizes.

Names.	Number per pound.		
	1in.	1½in.	2in.
Composition	164	144	96
Cast iron	180	145	90
M. S. 18in. 19in.	280	150	120
Galvanized	280	220	90

Labour.—The labour in holding slates, any size, is usually estimated at 2s. per thousand. But if a slating machine is used a smart boy, at 10c. per hour, will be able to hole from 300 to 400 slates in an hour, equivalent to 1s. per thousand.

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or acceptance at three months. The analysis of concrete slating per square would then be as follows:—

1st. best quality Concrete slates laid to 2in. lap.	£ 8 s. d.
2nd. best quality Concrete slates laid to 2in. lap.	£ 10 s. d.
3rd. best quality Concrete slates laid to 2in. lap.	£ 12 s. d.
4th. best quality Concrete slates laid to 2in. lap.	£ 14 s. d.
5th. best quality Concrete slates laid to 2in. lap.	£ 16 s. d.

Lathe, boarding, felting, &c., are taken in Carpenter.

If the foregoing is subtle to a slate merchant, it can be done for 2s. to 28s. per square, as the latter buys his slates at the quarries in large quantities, conveys them by sea, and regularly empties them.

A costly item in connection with slating is the repairing or replacing of slates broken after the slating is completed by workmen moving on the roof.

Curved Slating is valued in the same way, but the slates are necessarily smaller according to the radius of the curve, and they are graduated in diminishing sizes from eaves to apex. This requires slates of varying sizes, and an extra 5 per cent. for waste in cutting to graduated shapes, as well as additional labour. The whole will amount to one-fourth more in cost, or one-third if the circular slating is quick or small.

Half or spaced slating will cost one-fifth less.

Vertical Slating to walls is similarly calculated as for roofs, except that the labour in fixing is increased by half as much again.

Touching.—This is the term applied if when the slating is laid on laths or open battens the underside is pointed with hair mortar. Of this two-thirds cube will be required. It will take a bricklayer two hours and a labourer half-hour to point a square.

5c. cube hair mortar at 7d.	s. d.
1 lb. bricklayer at 6d.	0 5
1 lb. labourer at 6d.	0 3
Cost per square	2 4
Cost per square	0 3
Cost per square	2 7

Plum Ridge Tile, Tin, Wings, Set in Hair Mortar and Pointed with Mud.—The net cost of the ridge tile add carriage, hair mortar, cement, labour, and profit, as below. The tile is 18in. long, at 7d. each, = 42d. per foot run.

1 lb. ridge tile, tin, wings, supplied only	s. d.
1 lb. carriage	0 4
1 lb. hair mortar for setting	0 0
1 lb. cement for pointing	0 0
1 lb. labour	0 0
1 lb. profit	0 0
Cost per foot run	0 6
Cost per foot run	0 6
Cost per foot run	0 7

Make good Slating to Pipe passing through Roof.—This will occupy one hour of a slater and boy at 1s. 2d., and allow for an additional slate or two and nails as well as profit, making, say, 2s. in all.

Slate Damp-proof Course has already been analysed under Bricklayer, and need not be repeated.

Slate Masonry.—As slate masonry consists of such special work as fittings to shelving, washings, benches, lavatory tops, urinals, &c., which need regular machinery to execute the sawing, planing, rubbing, sanding, &c., it is always better to let this to proper slate merchants, who make a special estimate for supply while the builder fixes.

(To be continued.)

ROYAL INSTITUTE OF PUBLIC HEALTH.

ON Monday morning the congress of the Royal Institute of Public Health at Eastbourne resumed its sittings, several subjects of interest being under consideration. In the Preventive Medicine and Vital Statistics section, Dr. Alfred Greenwood, of Crew, read a paper on "The Need for Legislation in the Disinfection and Cleansing of Railway Carriages." It was subsequently proposed by Councillor Norman, of Jarrow, "That the attention of the Government be called to the danger to public health caused by the lack of frequent wet cleansing and disinfection of railway carriages, trams, and omnibuses," and this was carried.

Papers by Miss Constance Barker, National Health Society lecturer, East Sussex County Council, on "Elementary Education in connection with Public Health," and by Mr. H. Reale Collins, Kingston-on-Thames, on "Hygiene in Schools," were then discussed. Miss Barker complained that except and practice did not get hand in hand in the elementary schools. Moreover, in the application of the laws of health to the schools they were lacking, for she had observed instances in which months and even years elapsed before the effective cleansing of the buildings. Professor Smith, the president of the institute, said that he was glad that prominence had been given in the presidential address of the Duke of Devonshire to this important subject. He found that the frequent cleansing of the schools involved an expense which was an obstacle; but he did think that, in respect of the babies' classrooms or schools, this expense ought to be incurred. Dr. Newsholme, the president of the section, expressed himself in favour of doing away with schools for infants under the age of six years; and Miss Barker, in her reply, cordially agreed with this expression of opinion.

In the section for consideration of bacteriology, comparative pathology, and chemistry, the main interest centred in a paper by Dr. Buchanan, bacteriologist to the Corporation of Glasgow, on the recent outbreak of plague in that city, with special reference to morbid anatomy and bacteriology. The paper was illustrated by a series of slides showing the bacilli in various degrees of cultivation, and exhibiting the effects of the plague upon various organisms. Referring to the part usually assigned to rats in the dissemination of plague, Dr. Buchanan said that no trace of this was found at Glasgow, and they had, moreover, established that, although an undoubted instance of plague, it was capable of being stamped out by vigorous preventive measures.

Councillor Cowen, of Hull, proposed that this section of the Royal Institute of Public Health views with considerable alarm the possible introduction of plague and other infectious diseases into this country, and respectfully urges upon the Local Government Board that greater caution should be taken at our various ports. This meeting is further of opinion that, since the expenditure incurred is in the interest of the country generally, the Imperial Exchequer should contribute towards the same. Strong exception being taken to the latter portion of the proposition, this was withdrawn, and the motion as so amended was agreed to.

In the section devoted to municipal and Parliamentary hygiene considerable discussion followed the reading of a paper by Dr. H. Mansfield Robinson, LL.D., "as to the question of the period for the repayment of debt for erecting model dwellings." The speaker contended that the time for the repayment of the loan should be lengthened to 100 years as the minimum. Ultimately resolutions were adopted recording the emphatic protest of the congress against the persistent ignoring by the President of the Local Government Board of the unanimous recommendations of various public bodies in favour of the extension of the housing loan to 100 years. A second resolution, which was passed unanimously, was to the effect that, in view of the fact that the interests and repayment of housing charges being charged in some instances on the rents of the dwellings and falling upon the tenant and not on the ratepayer, such a repayment charge inflated the same beyond the means of the poorer workers and thus the effort of the municipal authorities to house them decently were crippled and frustrated. A further resolution appealed to the Government to adopt and pass the Bill now before them securing the extension of the housing loan to the minimum period of 100 years, and so assisting municipal authorities in palliating without further delay the dreadful evil of overcrowding. An interesting account of what had been done in Glasgow in connection with the erection of improved healthy dwellings for the working classes was given by Public Health Officer, Glasgow.

The congress came to a close on Tuesday. In the section for Preventive Medicine and Vital Statistics, Mr. Sidney Davies, Medical Officer of Health for Woolwich, alluded to the exemption of Government buildings from sanitary legislation, and expressed his opinion that the Public Health Acts should be made applicable to all property belonging to the Crown. After some discussion the resolution was carried.

Mr. Wolf Dietrich, member of the Institute

Mechanical Engineers, contributed a paper on "The Neglect of Standards in Public Health Work." He urged that there was a tendency to abandon a verified standard in dealing with the practice of water filtration. In the absence of other data, the Pasteur-Chamberland filter became a recognised standard—the only standard for the bacterial purification of water. It was subsequently found that, by substituting tubes made with fossil-meal for Pasteur tubes, a much smaller filtering surface could be used to yield the same quantity of water. Repeated experimental research showed that the filtering efficiency of such tubes was inferior to that of the Pasteur; but on the basis of some merely *prima facie* evidence, it was assumed that the difference of efficiency was not material for practical purposes.

One consequence of this inference was that the whole of the British Army in South Africa was equipped with these fossil-meal filters. In spite of their use, enteric fever followed our forces from camp to camp, creating a vastly larger list of casualties than was caused by the enemy. The material of the epidemic was such as to make it practically certain that a large part must have been water-born. Some portion of these cases were undoubtedly due to the fact that, among a large body of men, a certain number must not have the necessary self-control to wait while filtered water was served out. But it was difficult to imagine that the water was so bad for the vast number of cases occurring among these highly-disciplined troops. In the course of the short discussion which followed, a delegate asked for the authority of Mr. Deffries for the statement that our troops in South Africa suffered from the effects of inferior water filtration. Mr. Deffries said that the authority was Major Horrocks, Army Medical Officer at Netley.

A joint meeting of the sections for the discussion of preventive medicine and vital statistics and municipal engineering and surveying was held in the town-hall, at which there was discussed the subject of the ventilation of sewers, a paper was contributed by Mr. C. W. Wainwright of Westminster, on "The House and Town Drainage Systems of the Twentieth Century." Mr. Shone claimed that the drain and sewer ventilation problems, which had hitherto been considered and treated apparently by the highest authorities as they were and would continue to be insoluble, had got the solution. Dr. Weaver, of Southampton, on the other hand, considered sewer-gas was deleterious. If that was not the case, why was the expense of redrairie imposed upon the house-owners, as was frequently done? Dr. H. O. Pilkington, medical officer of health, Preston, in the Municipal Engineering and Surveying Section, spoke on the sanitation of the dwelling-house, and referred to the importance of a house being so situated as to receive a fair share of sunlight. Nothing was so opposed to the growth and multiplication of disease germs as sunlight, while for the proper development of health, among all respectable life, such light was essential. He touched upon the disease brought about by dirt and carelessness in the household, and said that for a real and permanent cure they must look to the education of the rising generation.

Much interest was shown in the paper read by Professor Bottomley, King's College, London, on "Some Recent Advances in Bacterial Treatment of Sewage."

In the afternoon, the closing meeting of the Congress was held in the town-hall. The Mayor of Eastbourne presided. Exeter was fixed upon as the place for the next Conference.

DUST AND TUBERCULOSIS.

At the International Congress on Tuberculosis, last week, Dr. Harold Cross, of Manchester, gave an account of an investigation into the presence of infective material in dust which occupied by consumptive persons, which he had been enabled to make by the adoption of the voluntary notification of tuberculosis in Manchester. Specimens of dust were collected from various places in which it had settled in the rooms. The houses investigated were of three

classes (1) in a dirty condition and inhabited by a consumptive person; (2) in a very clean condition and inhabited by a consumptive person; (3) very dirty but free from tuberculous disease for several years past. In class (1) 23 houses were examined, and in 14, or 66·6 per cent., the presence of infective dust was demonstrated. The conditions observed pointed to the conclusion that light and air are highly important, but that cubic space without ventilation is of small value. In class (2) 22 houses were examined and infective dust found in five, or 50 per cent. He drew the inference that ordinary cleanliness was not sufficient to prevent the accumulation of infectious material in rooms occupied by a consumptive. In this class also the importance of lighting and ventilation was clearly shown, as in all the rooms where no infective material was found both were good. In class (3) ten houses were examined and no infective material found. The inference was that the virulent dust found in houses of the first two classes was derived from consumptive patients. The method of disinfecting these houses adopted was by the use of a solution of 1 lb. of 100 to the gallon. The wall-paper is saturated with this, applied with a brush, and stripped off. The bare walls, ceiling, and floor are washed over several times, and also any articles of furniture that can be washed. Clothing and bedding are disinfected by steam.

The subject was followed by a discussion on the need of a standard of efficient ventilation. Dr. Arthur Ransome, F.R.S., said that it was our first duty in the prevention of consumption to get rid of the "air sewage," which caused more mortality than water sewage. This could only be done by copious ventilation, and he suggested that the amount of carbonic acid in the air should be taken as the standard of efficiency in ventilation.

FACTORIES AND WORKSHOPS.

THE CHIEF INSPECTOR'S REPORT.

THE annual Report of the Chief Inspector of Factories and Workshops for the year 1900 was issued on Saturday last. There are now 95,691 factories and 137,648 workshops. There were 4,093 in the first class, 3,463 in the second—and 7,529 places were marked for additional inspection under special rules framed by the Home Office under the Acts. Reports were received of 50,549 out-workers. There was a further increase in the number of reported accidents. These reports led to the certifying surgeons were 27,704, an advance of 4,933, or 21·7 per cent. on the total for 1899. The fatal accidents increased 20 per cent.; from 871 in 1899 to 1,045 in 1900. Minor accidents reported to inspectors only amounted to 51,316, against 47,959 in 1899. All reported accidents figure at 7,700, an increase of 8,260, or 11·7 per cent. Dr. Whitelegge says:

Among the causes of accident, hoists, lifting-gear, circular saws, hand machinery, escape of gas, steam, or metal, and, upon a smaller scale, electric shock, have a large share. In 1899 there were 1,069 cases. One conspicuous instance of decrease is under the heading of hot liquid and molten metal (in vat or pan), and this may be due to the fact that the system of including this among the class "escape of metal," rather than the former class, now that the tabulation is carried out upon the statistical office.

Lead-poisoning underwent a further decrease—from 1,258 cases in 1899 to 1,058 in 1900—and on this subject there is a valuable sectional report by Dr. T. M. Legge, the medical inspector, which sets forth certain practical conclusions to which the attention of those carrying on trades in which plumbism arises should be directed. As to general medical examinations by the certifying surgeons, required by special rule in cases where workpeople are engaged in dangerous occupations, they were 38,000 in number, resulting in 353 formal and 22 informal suspensions from work, in 71 instances the persons being allowed to resume their duties. In addition, many employers have been induced to adopt voluntary regulations, including periodical medical examinations, for the better protection of their workpeople, and the medical inspector's report gives facts which show that there is a considerable body of employers who are anxious to do so. In many instances in which the inquiry has been carried on not only in accordance with advanced legislation, but with the more experimental recommendations of scientists. On the other hand, the Blue Book abounds with cases which show indifference, if not obstructiveness, and this, of course, not only in processes of manufacture, but

also as to fencing machinery, sanitary arrangements, illegal overtime, and the like. Reference to the statistics of prosecutions will illustrate this point, though it is not strictly a legal case. In 1900 there were 3,287 prosecutions against 3,574 the previous year; and the large increase in the places registered, the greater stringency of the laws, and the added vigilance of the inspectorate, should here be borne in mind. The convictions numbered 3,151. The cases withdrawn on payment of costs numbered 1,000. The fines were £2,692 18s. 11d., and the costs to £1,273 6s. 1d.

Other points in Dr. Whitelegge's summary are that overtime working under the Acts shows a decrease; that while 194,404 places are reported as satisfactory in regard to means of escape from fire, 2,346 are unsatisfactory, if not actually dangerous; that some airtight-water manufacturers raise objections to the use of gauntlets and guards for the eyes and face, on the ground—denied by expert authority—that the use of guards causes injury to the sight; that special efforts were made to secure means of escape from fire, and young persons, especially during the pressure of war orders; that there is a marked improvement in the ventilation of humidified cotton-weaving sheds; and that there was a further decrease in the number of children examined for half-time employment, and a further increase in those examined for full-time employment. Those interested in the question of child labour and the effect of the Elementary Education Act, 1900, raising the age limit to 14 years, will find in the Blue Book a mass of suggestive information.

The Appendix contains twenty-two documents, each of which describes a separate aspect of the work of the inspectorate. These are detailed Reports on Out Work, Overtime, Bottling of aerated waters, Wall-paper making, Accidents in docks, Industrial lead-poisoning—to mention only a few. In addition there are ten sectional Reports, five of which are from the various geographical divisions.

There is a good deal in the Report about laundries—an industry undergoing a rapid change by the substitution of machinery for hand labour, and by the growth of small factories. The transition is thus commented upon by Miss Sadler, one of the inspectors:—

It seems to be due partly to the increased cheapness of certain machines, and largely to the fact that the wage bill is thereby so much lessened. It is a pity, however, that the introduction of machinery fails to force employers to secure better premises and better working conditions. Too often the plant is installed in the same building which has served for a "small" laundry, and is crowded into one or two small "well-ventilated" rooms, intended for, and quite unadapted for, the purpose. The prime mover, the small gas or steam engine, is in a badly-lighted basement, and in the charge of a man who knows little or nothing of the dangers or management of machinery. The fumes of the flywheel, in many cases, make the atmosphere insupportable. Other dangerous parts are equally disregarded, and it is difficult to persuade the owner to take any measures even with a low power. In great cases the dangers of these cheaper forms of machines seem often to be feared, though this may be the case in the future, owing to the complaints of the purchasers that this should be included in the estimate.

The Act requires that the floors of washhouses should be "drained in such a manner as to allow the water to flow off freely"; but, says Miss Deane, provision is not needed for drainage at the place of discharge:—

It is not at all uncommon to find that the yellow and foul water from a row of tanks or washing machines at one side of a wash-house flows all across the floor to the feet of the women who are eventually reaching the drain. This unsatisfactory arrangement is to be found in many jam factories also, so that the water is not only discharged over the feet in this manner every twelve or eighteen minutes from certain parts of the premises, but the occupier is continually pointed out that it "flowed quite freely" to the drain on the other side of the shed.

The Reports abound in evidence condemnatory of domestic laundries. Miss Vines, one of the inspectors, contributes the following:—

Frazer talks I have had with district nurses about their patients in domestic laundries, it would seem that inspection is not unneeded. One case, that of an old woman with eczema in the neck, was particularly revealing. The nurse, who was called in to attend to the patient's house, she would find the customer's face encumbered with skin and handkerchiefs used *propter* as handkerchiefs, and the woman would be asked to wash her face. This good woman, it appeared, was always very anxious to get the clothes home by Saturday. She was later told that the woman was in the laundry for them, and that they once even came down the street as she was sure neither they nor the washing would ever come again.

The Parliamentary Committee on London Underground Railways have reported favourably on a line from Hammersmith to the City, via Piccadilly.

BRITISH MASTER PLUMBERS' ASSOCIATION.

MEETING IN EDOUARD.

A MEETING of the Central Board of the National Association of Master Plumbers of Great Britain and Ireland was held in the Masonic Rooms, Ann-street, Ranelagh, on Wednesday week. Between 20 and 30 delegates from various parts of the country were present. They were cordially welcomed to Ranelagh by Mr. John Tongue, the president of the Ranelagh Municipal Master Plumbers.

The business meeting was under the chairmanship of Mr. W. L. Harrison, of Hull, the president of the association. A variety of matters of interest to the trade were considered.

Mr. W. Challenger, of Blackford, read a paper advocating the holding of exhibitions of plumbers' work in various parts of the country as a means of raising the status of the trade, by encouraging plumbers to take a deeper interest in their trade.

The afternoon meeting was devoted to general association business, of which the delegates had a visit to the town-hall.

The Mayor (Alderman Tupper) joined the delegates at tea, and remained to the subsequent smoking concert, which the members of the Ranelagh branch had arranged.

The National Association of Master Plumbers, which five years ago, has now a membership of 1,200, and is in a flourishing condition.

The arrangements for the reception of the association were made by Mr. John Tongue and Mr. F. Kershaw, president and secretary of the Ranelagh Master Plumbers' Association. The members of which hospitably entertained the delegates.

LONDON COUNTY COUNCIL.

AT the weekly meeting of the Council on Tuesday, the Highways Committee recommended—That the standing orders of the Council relative to applications to Parliament for powers be suspended so far as may be necessary, so that the Council may consider the following recommendation:—That application be made in the next Session of Parliament for powers for the construction by the Council of the under-mentioned new tramways:—(1) Along the Victoria Embankment from a point near the Westminster Bridge to a point near the Tiffiniers Bridge; (2) along Elgin-road, from Edgeware-road to the Harrow-road and Paddington Tramways Company's line in Harrow-road; (3) Trafalgar-road, Greenwich (London County Council Tramways), via Blackwall-lane, to a point near the southern approach to the Blackwall Tunnel; (4) Hertford Hospital, Woolwich (proposed London County Council Tramways), via Wall-hill-road to Eltham, and thence via Highstead, Eltham, to a point near the Monument at Eltham Park."

The recommendation was adopted.

The recommendations of the Improvements Committee for carrying out the street widenings necessary for these tramways were also carried.

HAMPSHIRE ROAD IMPROVEMENT.

The Improvements Committee recommended:—(1) That, subject to a contribution by the Council of the metropolitan borough of St. Pancras of 500 ft. of the net cost of the improvement, application be made to Parliament in the session of 1902 for powers to widen Hampshire-road between Euston-road and Tolmers-square, as shown upon the plan presented to the Improvements Committee on May 1, 1901; (2) that a clause be inserted in the Bill to provide that the carrying out of the improvement by the Council shall be proceeded with immediately on the Council of the metropolitan borough of St. Pancras giving its statutory consent to the construction of a tramway from the present terminus in Hampshire-road across Euston-road and along Tottenham Court-road to a point near Oxford-street; (3) that exemption from the operation of the third section of the Lands Clauses Consolidation Act, 1845, be sought to enable the Council to acquire, if necessary, only portions of the properties Nos. 29 and 42, Hampshire-road, instead of the Council being required to purchase the whole of the properties in question; (4) that provision be made in the Bill for part of the cost of the improvement to be recovered by means of an improvement charge; (5) that, in connection with the foregoing recommendations, the usual provision be inserted of resuming in the Bill a clause to provide that improvements made in

lands or premises after July 23, 1901, when the scheme was made public, shall not be taken into account in assessing compensation, if such improvements be made with a view to obtaining compensation or increasing that payable by the Council.

The recommendations were adopted. The net cost of the improvement is estimated at £223,500.

REID'S BREWERY SITE.

The Housing of the Working Classes Committee asked for a vote of £15,000 to cover the cost of the foundation of several blocks of working-class dwellings to be erected on the site of Reid's Brewery in Clerkenwell-road, which has been purchased by the Council to provide a portion of the accommodation for those displaced through the Holborn Strand improvement.

Mr. R. Williams moved that the recommendation be referred back to the committee, with instructions so to amend the plans for this site that not more than 500 persons to the acre be housed thereon.

Mr. Buchanan seconded the amendment.

Mr. Hunter said that if they were to adopt the amendment they would have to give up the idea of building for the poor of London.

Mr. Waterlow said that the Council had to regulate the number of persons to be put on each acre by its standing orders, and by consideration of the regulations of the House Office, and that there should be no charge on the rates.

The amendment was negatived, and the recommendation of the committee adopted.

THEATRE REGULATIONS.

The Theatres Committee submitted for approval a new code of regulations under the Metropolitan Management and Building Acts Amendment Act, 1878, with respect to the requirements for the protection from fire of theatres, houses, rooms, and other places of public resort within the county of London.

A long discussion took place on this recommendation, it being contended by many members that the regulations had not been before the public and the theatrical profession for a sufficient time. Ultimately an amendment to refer the matter back was rejected and the regulations were approved.

Replying to questions, Sir Algernon West (chairman of the committee) said that it was not correct to say that the effect of the regulations would be seriously to curtail the accommodation of the public. The proposed barriers, S.H. high had been eliminated, and there was no provision remaining which would interfere with people standing at a theatre or music-hall and seeing the performance. But the committee felt very strongly that as in former times a theatre was supposed to hold only those who were sitting, and that the public well known now that they were not provided for more than half the number of those who went to music-halls, it was perfectly justifiable now to require that in calculating the number of exits required in case of fire, regard should be had to the standing room as well as to the amount of seating accommodation.

THE WIDENING OF PICCADILLY.

The Improvements Committee reported that in connection with the widening of Piccadilly they had had a conference with Viscount Esher (secretary of His Majesty's Office of Works), and they had the satisfaction of reporting that arrangements had been made by which it was believed that it would be possible to retain as many as eleven of the existing trees near Park-lane and one near Walsingham House, whilst several of the existing young trees would be transplanted into the tree-pits in the new footway. The work of cutting down the trees which could not possibly be retained would be undertaken by the Office of Works, and Viscount Esher had expressed his desire to assist the Council as far as possible in its endeavours to save the existing trees.

The report was received, and other business having been transacted, the Council adjourned for the summer recess until Tuesday, Oct. 8.

LONDON STREETS.

THE state of the London streets is not very creditable to the authorities. During this hot and oppressive weather the unpleasant smells of the crushed and desecrated refuse, added to the constant disturbance of traffic by breaking up the roads, is one of the abominations of town life in

summer time. But in Continental cities, and in Glasgow, nothing of this sort is tolerated. The street refuse or droppings, instead of being allowed to be crushed and blown about, is swept into receptacles sunk in the pavement, or by a continuous supply of water and hose the streets are swept and cleansed, while the hose is used for cooling the air. In Paris, Vienna, and Berlin, the streets are swept and washed down by means of the hose twice or three times a day. One sees the use of a kind of folding hose that enables the fire stream to be turned on to every corner of the street without wetting pedestrians, which is the case with our old water-carts. An army of street orderlies is engaged in the main streets for the purpose of sweeping and cleansing them. Wood and asphaltic pavements can only be kept in a clean and sweet condition by the use of water.

The new borough councils cannot direct their attention to more useful public objects than the provision of street receptacles for street droppings, grit, improved watering apparatus, and good street paving. We shall not keep pace with other towns, on the Continent, if our city streets have their subways, and all tampering with roadways to repair and renew telephone wires, gas and water pipes, is done away with. The constant diversion of traffic arising from obstructions is becoming more intolerable every year.

This time, too, that Newcomen's steam engines for crossing the streets in their place foot-bridges?

These need not be made ugly or obstructive, and our city and west-end authorities might do something at once to relieve the congested centres. Then sanitary regulations should come before structural improvements. The widening of subways would be a step, at least, from our crowded streets much that is objectionable. Then we suffer largely from imperfectly administered law. On the Continent the police law is very strictly enforced: householders and tradesmen are not allowed to throw their refuse on the streets. Here we constantly see tradesmen and shop attendants sweep out on the pavement the refuse of a shop—scraps of paper, straw, vegetables, and other decaying matter; these are swept into the road gutters, regardless of all decency; then the London tramways, with their filthy appearance, the appearance of the footway opposite his premises. Our great sewers are controlled by the London County Council, and objection is made to the sweeping of anything through the gully-gratings. In fact, London is so divided in its control, that much complaint is made by the local authorities in questions of labour in cleansing our streets, that surveyors find themselves under-staffed when any heavy storm-fall chokes up the road gratings, as it did a few days ago, or a heavy snowfall dislocates the traffic. On the other hand, it is not possible for the surveyors to order a large gang of men immediately, without regard to whether the wages should be 5d. or 6d. per hour. Then there are questions constantly arising as to repairs, the liability of private owners to remove snow from footways, the cost of improvements, and sundry other questions, that will never be placed on a proper basis so long as the conditions of our municipal legislation are what they are. So long as the borough councils are divided on questions like the paving of the roadways and the maintenance of the streets, it cannot be expected that the Metropolis will compare favourably with other cities.

DESIGNING IRONWORK.*

WE have noticed previous parts of this useful series. Prof. Adams has followed up his calculations of stress diagrams and working drawings for a steel box girder with a single web, and now gives the principles for a built-up steel stanchion 30ft. high, to carry a dead load of 60 tons, which cannot fail to be of practical value to all students of architecture and engineering. The author's notes and references are concise, and add much to the calculations. The calculations and the author's calculations apply to detached stanchions. The author says truly, the designing of a stanchion or strut is more difficult than that in designing other parts. "We cannot by a single

* Designing Ironwork. Second Series. Part III. Notes, Formulae, Calculations, and Working Drawings for Built-up Steel Stanchions. By HENRY ADAMS, B.Sc., M.A., N.E. (Mech.). Professor of Engineering at the City of London College. London: 60, Queen Victoria-street.

calculation proportion the sectional area to the load by taking a factor of safety upon the ultimate strength. Generally the length and load are settled, leaving both the diameter and sectional area to be determined, together with the floor cross-section, which latter, again, largely depends upon the relation of the diameter to the sectional area. The difficulty is greater in proportion as the length is increased and the load reduced, but it exists more or less in all cases. We are in this dilemma—that we cannot tell what will be the safe intensity of the stress or working load per square inch on the stanchion until we know the ratio of length to diameter, while the diameter depends on the sectional area requisite to provide for the safe intensity of stress." So that, in designing such a member, it is a matter of "trial and error" till we come nearer the truth each time. By means of an approximate formula for safe load per square inch on an assumed diameter, the process may be shortened. Various sections are illustrated, such as the Z-bar columns so often used in America, plain or boxed form; the "Phoenix" column made up of segments united by flanges; the cross-sections of the stanchion, and of the flanged sides, and other forms. The author gives some useful data relating to the diameter and pitch of rivets: the former is usually $\frac{1}{2}$ in., and the latter should not exceed six diameters, or ten times thickness of plate. The working strength of mild steel may be taken for tension at 7 tons per square inch, compression at 6 tons, shearing 5 tons. For steel rivets, 6 tons per square inch in single shear is allowed, their bearing pressure not being more than 10 tons per square inch. The process of calculation is made clear step by step. Having found the approximate sectional area required for the stanchion, or 24 sq. in. in the sketch of a built-up section about 9 in. diameter and containing about that number of square inches. Gordon's formula for a built-up steel stanchion is applied to test the section. A revised section is obtained with a diameter of 10 in., and Fidler's formula is adopted to check the result. The author gives several formulae for Euler's, Johnson's, Rankine's, and other formulae; Carnegie, Phipps, and Co.'s formula, Professor Merriman's, and then reviews the results obtained, which vary considerably. Gordon's formula, with Claxton Fidler's coefficient, gives a safe load of 667 tons for 25 sq. in. section. Professor Adams gives Fidler's formula as the most reliable, and one to work with experiment. This little work shows how the design is calculated and the results worked up in the drawings. Every process is shown by numerical examples. The student will find the dimensions of the base frame required for a stanchion of 60 tons, at 15 tons per square foot, will require 16 sq. ft. of base, 2 ft. square; also the area and thickness of stone base and brick footings, or 4 ft. 6 in. square. The concrete foundation and distribution of weight are all clearly worked out, and the complete design with its rivets is illustrated. Every architect and engineering student will find much valuable information in this little work. The cost of the work is only 2s. 6d. Professor Adams shows there is no half-and-fast rule to find the strength of columns, even where the ultimate strength and elasticity of the material is known; the calculation must be carried on by "trial and error" expedited by known formulae.

PROPOSED NEW CREMATATORIUM FOR LONDON.

THE sanitary committee of the Corporation have recently been requested to consider and report as to the most suitable site for a City of London Cemetery at Ilford for the erection of a crematorium under the powers conferred by the Act of 1900, with instructions to submit for approval plans and estimates of the proposed buildings. A deputation of the committee visited the crematorium at Hault, Manchester, at Woking, and obtained interesting particulars as to their working, expense, &c., and the committee then requested the city engineer (Mr. D. L. Ross), to prepare sketch drawings of a suitable crematorium with two furnaces, for erection at Ilford.

The plan provides for a chapel, having an entrance porch and one or two chapels, a cremating-chamber, which will be at the rear of the chapel, will be of ample dimensions to admit of two cremating-furnaces being erected, with an

arrangement for the bodies being placed in either furnace by means of a traverse, with the catwalk in the centre. The building will have a flat roof, with stone parapet, and will be made as unobtrusive as possible. The furnace flue will be arranged at the centre of the tower, which will form a feature in the buildings, and will be about 50 ft. in height, a small auxiliary furnace at the base of the tower being provided for the more perfect consumption of gases arising from the cremating-furnace. The crypt, or columbarium, under the chapel will be fitted up for the reception of the urns, and the various monuments can be attached to the walls or niches.

The buildings will be constructed principally of stone, and the designs have been made to harmonise in style and character with the existing chapels at the cemetery. The estimated cost will be about £10,500. The committee are strongly of opinion that if this mode of sepulchre is to be made popular, buildings should be erected of a character that will permit of cremation being carried out in good surroundings and in a manner which will commend itself to the most sensitive. The Corporation have deferred the consideration of the report until after the vacation.

CHIPS.

Lord Tredegar has acquired the ruin of Newport Castle, with the intention of restoring and preserving it.

The largest artesian-well scheme in the country is to be set on work at Gainsborough. The second "boom" has been carried to a depth of 500 ft., yielding a copious supply, and the contract for the pumping machinery has now been placed. A very high system is guaranteed, and it is anticipated that the well will have a most economical waterworks system.

The Isle of Thauet Joint Hospital, Romsgate, is being warmed and ventilated throughout by means of Shorland's patent double-fronted Manchester stoves, with descending smoke-flues, and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The chairman of the Fire Brigade Committee of the London County Council, on Monday, laid the memorial-stone of a new substation now being erected at High-street, Hounston. The site has cost £1,750, and the estimate of the architect, Mr. W. E. Riley, was £8,000. Messrs. Martin, Wells, and Co. undertook the contract for £28,125, and the work was commenced in May last.

A large Cambridge quarter-chime clock, striking the hours on the tenor bell of 30 cwt., and the quarter on a smaller bell of 15 cwt., for the parish church, Ambleside, with all Lord Grimthorpe's latest improvements inserted, has just been completed by Messrs. Wm. Potts and Sons, clock manufacturers, Guildford-street, Leeds.

A Local Government Board inquiry was held by Mr. Thomas G. Bower and Co., Brisbane, in regard to a proposed sewerage scheme which the rural district council desire to carry out, and for which they have made application for a loan of £800. There was considerable opposition.

The Marine Board, Hobart, has accepted the tender of Messrs. G. Bower and Co., Brisbane, for the construction of a new pier at £16,665; the work to be done in 36 weeks. Other tenders ranged up to and over £23,000, and the time to 172 weeks. The penalty for delay is £50 per week, with an equal bonus for the saving of time in completion.

The foundation-stones have been laid of a new Wesleyan church in Station-road, Edgington. The edifice will be constructed from plans by Messrs. Even Harper and Brother, Corporation-street, Birmingham, in front of the existing church, the main front to be to Station-road. The design is in the Gothic, and the building will be of bricks with stone dressings. Provision is made in the design for the future addition of a tower, with spire, and also for further accommodation by the addition of transepts. The builder is Mr. Isaac Langley, of Tyburn, and the cost will be about £5,000.

There was unveiled, in the library of the County Hall, Spring-gardens, on Tuesday, the portrait of Lord Welby, who was Chairman of the County Council for the years 1899-1900. The portrait is by Sir William Richmond, R.A., and its cost has been defrayed by subscription raised among members of the Council.

Lord Edmund Talbot, M.P., opened on Friday a new Roman Catholic elementary school in Clifton-street, which has been erected by the Society of the Fathers of the Brampton Oratory. The principal part of the cost has been defrayed by a sum of £3,000 presented to the Fathers by the Duke of York on behalf of the Roman Catholics of England in commemoration of the golden jubilee of the Oratorians in London.

Building Intelligence.

BUCKLEY, FLINTSHIRE.—The new chancel added to St. Matthew's Church as a memorial to the late Mr. Gladstone was dedicated by the Bishop of St. Asaph on Wednesday week. The memorial has now been carried out at a cost of £1,100, exclusive of furniture and fittings, which will cost an additional £200. The form of the new chancel has been determined by the old structure. Two features of the old east end were the octagonal turrets. These have been, as far as possible, retained. The walls inside and externally are of ashlar. The sedilia and credence are worked in the south wall, and on the opposite side is a door communicating between the sacristy and sacranium. Messrs. Parker Bros., Chester, have been the contractors, Mr. E. Bell being the foreman, and Messrs. Douglas and Minshall, Chester, the architects.

LEEDS.—The Masonic Hall, which has been in course of erection for some months in Great George-street, Leeds, was consecrated on Monday by the Right Worshipful Provincial Grand Master, W. L. Jackson, P.M.C. Erected from the designs of Mr. J. M. Bottomley, the frontage is of brick—brown-glazed in the basement; red-pressed, with red sandstone dressings, above; and buff, with stone dressings, higher still. A vestibule gives access on the ground floor to the rooms, which will be used for the Provincial Grand Lodge purposes, and to another apartment suitable for small lodge meetings. On the first floor is a dining-room overlooking Great George-street, capable of seating 400 persons. Behind this is a smaller dining-room, and between the two a lounge, whilst the service-rooms are also placed. On the second floor is a principal lodge-room, which is of about the same dimensions as the larger dining-room. A lift affords communication between the different floors. Mr. J. T. Wright, builder, has executed the principal contract. The hall has been erected at a cost of about £14,000, including land, by the Leeds Masonic Hall Committee Ltd. One adjacent to the new Roman Catholic Cathedral is about to be built. The building was illustrated in the BUILDING NEWS for July 20, 1900.

NESTON.—The foundation-stones of a Liberal Club were recently laid. The site has its frontage to Chester-road, and is large enough to provide in addition to the club a bowling-green about 55 yd. square. The dining-room and committee-room is about 30 ft. by 17 ft. The main debating-room will be 60 ft. by 37 ft. 6 in. It will have windows on the west side, looking on to the bowling-green. The room will be warmed by a system of hot-water pipes. Facing the door at the far end will be a platform 26 ft. by 15 ft. At the back of the hall will be a billiard-room, 32 ft. by 22 ft., holding three full-sized tables, with seats all round. On the east side of the hall will be the kitchen, scullery, stove, and hot and cold-water baths, shower-baths, lavatories, &c. There will also be another smaller committee-room. Mr. T. Taliesin Rees, F.R.I.B.A., Hamilton-street, Birkenhead, is the architect, and Mr. Jas. Evans the builder.

SOUTHEAST-ON-SEA.—Lord Claud Hamilton opened, on Wednesday last, week, the new Kursaal. It occupies a prominent position on the Marine Parade facing the sea. From the entrance-hall, which is surmounted by a lofty dome, radiate the arcade leading to the hippodrome, the dining-hall, capable of seating 1,000 people, and the ballroom. The dining-hall accommodates for 2,000 dancers, with a parquet floor in different stained woods, which alone cost £3,000. At the end of the ballroom there is a stage for theatrical performances. The foundations for the tower, which will reach a height of 450 ft., are already laid, and the total cost of the buildings will amount to £100,000. Adjacent to the Kursaal are the gardens, upwards of twenty acres in extent, with cricket oval, cycling track, &c.

SEAFOOT, LEEDS.—Some time ago the Leeds City Council decided to expend about £200,000 on extensions of the hospital accommodation at Manston (now known as the Scaferoff Hospital), from plans by Mr. J. T. Hall. To consider the policy to be adopted in the letting of the contracts the Sanitary Committee held a special meeting last week. An influential deputation, representing the Master Plumbers', Plasterers', Painters', and Slaters' Associations of the city waited upon the committee, and urged them

to let the work for the extensions of the hospitals, instead of, as is frequently done at present, to a general contractor, and submit by him. One reason why this desired a change was that at times they were liable to the loss of their money. The committee, after considering the matter, decided to let the work in one contract, subject, however, to the following conditions:—1 That the contractor should have power to submit to such master tradesmen as might be approved by the committee. 2 That a clause should be inserted in the contract requiring the contractor should produce to the architect the receipt for the payments to the sub-contractors before the chief contractor himself should be paid by the council.

W. W. EAST, KENT.—The President of the Board of Agriculture, the Rt. Hon. R. W. Hasbany, M.P., has formally opened the recent additions to the South-Eastern Agricultural College. The new work consists of the extension of the quadrangle, begun in 1894, as far as the boundary of the College property and the addition of a further wing, together with additions and rearrangements in the kitchens and other domestic buildings. The refectory has been enlarged by taking in a passage, so that the old minstrel's gallery now becomes a gallery in fact as well as in name. The biological laboratory, built in 1894, has been enlarged and rearranged, so that there is now working space for thirty students. Opening from this laboratory, a smaller one has been built for the professor of botany, with working tables, incubators, and other appliances for botanical and bacteriological research. A similar laboratory has been built for the special work of the lecture in zoology and economic entomology. Adjoining these laboratories is the museum, a large room which is as yet without its proper equipment of cases and tables. The adjacent lecture-room is also new. With the old lecture theatre there is now accommodation for simultaneous lectures to both first and second year men. The drawing-office occupies the eastern side of the quadrangle, it is 33 ft. long, and it provides working space for 24 students. The eastern side of the new quadrangle is completed by the principal's offices and a large common room for the students. The chemical laboratories occupy the ground floor of the new wing, which runs to the eastward of the new block of buildings. The general students' laboratory measures 45 ft. by 50 ft., and it gives working space for 30 students. Separated from the main laboratory by a glazed partition is the balance-room and the larger of the special laboratories for analytical work and research. Adjoining this is a smaller room reserved for gas analysis, titrations, &c. There is also a small room for furnaces and a drying chamber. The old laboratory is now taken into domestic offices. On the first floor of the new buildings additional students' rooms have been built, so that there is now accommodation within the college for 50 students and two members of the staff. These rooms are approached by three staircases, thus dividing the rooms into separate blocks. On the farm there have been recently erected two new cattle-sheds. Mr. Thos. F. Gellatly, F.R.I.B.A., of London, was the architect, and Mr. A. J. Wise, of Deal, the contractor.

In the case of the application for discharge from bankruptcy made on behalf of Isaac Cheadle, of Oxford, file leaver, builder, the order has been refused, with liberty to apply again at any time after June 13, 1902, on giving to the Official Receiver and to the Registrar of the Court 25 days previous notice in writing.

At the Coventry Police-court, on Thursday last week, the coroner, presiding, Mr. Spencer Bush, builder, West-street, for erecting ten houses in Smith-street without submitting a bill-plan, as required by the corporation's by-laws. The defence was that the officers had been negligent or committed an error, and the defendant gave evidence to the effect that he considered he had complied with the requirements of the by-laws. The bench, however, imposed a fine of £100 and costs.

MR. W. H. MEAD, King, M.I.N.T.E.C., an inspector of the Local Government Board, held an inquiry at the town-hall, St. Helens, on an application by the corporation for sanction to borrow £16,500 for the purpose of extending the electric light works, and for securing by an unimpaired balance of a loan of £2,500, a fund to be applied for works of storm-water drainage, towards the cost of culverting the break between Spray's Bridge and Kirkland-street.

PROFESSIONAL AND TRADE SOCIETIES.

CHAMBER ARCHÆOLOGICAL ASSOCIATION.—The fifty-third annual meeting of the Chamber Archæological Association, which opened on Tuesday, at Newtown, Montgomeryshire, has been continued throughout the week. Interest is lent to this the first visit of the association to the country, by the fact that the excavations recently begun on the site of the old Roman city at Cherswell. On Tuesday evening a public meeting was held, Colonel Pryce Jones presiding. After the presidential address papers on the archæology of the district were given by Mr. Richard Williams, F.R.Hist.S., and others.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.—The annual general meeting of this society was held at the London Institution, Finsbury-circus, on Friday afternoon. Mr. E. W. Brubaker, treasurer, presided and moved the adoption of the council's 46th annual report, which showed that, as at the last annual meeting, the members numbered 161. During the year the management had been very successful. The council appealed for an increase of membership, pointing out that there was a noticeable revival of archæological interest among all classes of society in London. The motion was adopted. Mr. Freshfield was re-elected president, and Mr. C. H. V. Barker, secretary. The latter called attention to the work done by the society, which by fostering the love of antiquities among all classes of the people indirectly contributed largely to the preservation of objects of interest.

ROYAL INSTITUTE VISIT TO GLASGOW AND ANNUAL DINNER, 1901.—The Glasgow Institute of Architects are making arrangements for a visit of the Royal Institute to Glasgow early in October of this year, and during the visit an annual dinner of the Institute will be held. The date fixed for the dinner is Thursday, Oct. 3. The programme of the visit as at present arranged is as follows:—Thursday, Oct. 3: R.I.B.A. annual dinner. Friday, Oct. 4: 1) Lunch in the Exhibition grounds, given by the Glasgow Institute to the Royal Institute visitors. 2) Visit to the Glasgow University (tea), 3) conversation given in honour of the Royal Institute by the Corporation of Glasgow. Saturday, Oct. 5: Visits to Exhibition, &c. At all Friday's functions the presence of ladies will be welcome. Applications for tickets should be made as soon as possible to the secretary, R.I.B.A. The list will remain open until August 31.

SOMERSET ARCHÆOLOGICAL SOCIETY.—The members of this society commenced their fifty-third annual meeting at Bristol on Tuesday. The Bishop of Bristol presided. According to the report, 27 new members had joined during the year, 31 had resigned, and 10 struck off for arrears of subscriptions, the net loss being 14. Total membership to date, 597. The president's address dealt mainly with the Jewel of Alfred the Great. A paper on the hospital of St. John, Bristol, by Mr. John Latimer, was read by Mr. John Richard. Temple Church, St. Peter's Hospital, and the church of St. Andrew's were subsequently visited, the last-named building being described by the architect, Mr. H. C. M. Hirst. At the evening meeting Professor Lloyd Morgan gave some particulars respecting the stones at Stanton Drew, illustrated with views projected upon a screen. He said that he believed the stones were not put down in haphazard fashion, but formed a scheme. Canon Church followed with some account of the library of the Cathedral Church at Wells.

A window in memory of Mr. Gladstone, which was commissioned jointly by the Byron Society and some members of the Grosvenor House Committee, was shown on Wednesday to the Press at the studio of E. W. R. Frampton, 110, Buckingham Palace-road. It is a representation of the Crucifixion, with the figures of the Mother of the Lord, of St. John, and of Mary Magdalene.

On a commanding site on Isaac's Hill, Cleethorpes, the foundation-stone of the new Technical Institute has just been laid. Towards the total cost of £100,000, the Lancashire County Council is contributing £336 15s., and the remainder is being found by the urban district council. On the ground floor there will be a manual instruction room, 40 ft. by 20 ft., and two large classrooms, a workshop, chemical laboratory, lecture theatre, and a balance room above. Mr. F. W. Croft is the architect, and Mr. W. I. on the builder.

COMPETITIONS.*

ROBSON AND WALTON-ON-THE-HILL.—At the last meeting of the Court of Common Council for the City Mr. Mercer presented an adjourned report from the Freeman's Orphan School Committee on the subject of the removal of the school from Ferndale-road, Brixton, to Walton-on-the-Hill. Authority was asked to invite six architects to submit designs for the new school, the £75 being presented to each of the unsuccessful candidates. The appointment of Mr. E. R. Robson, F.R.S.A., as assessor was also proposed, the remuneration proposed being £105. After a discussion and division, the report was referred back to the committee for reconsideration.

UNITED METHODIST FREE CHURCH AND SCHOOLS, WESTLEY-ON-SEA.—The design submitted in a recent limited competition by Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, architects, 5, Clement's Inn, Strand, W.C., for the above church have been adopted by the committee, and the first portion of the scheme, including church, vestries, &c., is to be proceeded-with at once.

CHIPS.

In connection with its new sewage works, the Swinton and Pendlebury District Council has decided to adopt the patent distributing apparatus invented by a local engineering firm of Messrs. Bather and Threlkeld, of Salford, for the disposal of bacteria beds. By the installation some 2,000,000 gallons of sewage can be daily dealt with.

On Tuesday week the Archbishop of York formally dedicated Queen Margaret's Girls' School, Scarborough, designed by Mr. J. H. Eyke, architect, of London, on the south cliff, is in connection with the Woodall Schools Society, and is under the management of the Provost and Fellows of Doncaster.

The new grammar school for Lichfield, of which the foundation-stone was laid on July 20, is being erected from plans by Mr. J. H. Eyke, architect, of London, the builders being Messrs. J. Ward and Son, of Uttoxeter.

The Dean and Chapter of Exeter have opened a subscription for rehanging and retaining the peal of bells in the cathedral towers, and raising the number from eleven to thirteen. The work, which will cost about £12,000, is to be carried out by Messrs. Taylor and Sons, of Loughborough.

The Roman Catholic Archbishop of Dublin last week laid the foundation-stone of the new chapel and nuns' residence of the Poor Servants of the Mother of God, which are about to be erected within the grounds of the Rathdown Union Work-house at Loughlinstown.

An anonymous donation of £5,000 has been given for the purpose of building a permanent nave to St. Saviour's, St. Alban's. The chancel has already been erected.

A large amount of business was transacted at the Tokenhouse-yard Mart during last week, the total amounting to £238,654. The principal feature was the sale of large City and West-end properties. A good deal of agricultural land also came into the market.

The committee of the House of Commons presided over by Sir David Milner sanctioned on Friday Mr. F. H. Behr's scheme for the construction of a railway on the principle of the Metropolitan and Great Northern and Liverpool. The scheme has already received the sanction of the House of Lords.

The unveiling of the memorial window which has been placed in a parish church of All Saints, King's Langley, in the memory of her late Majesty Queen Victoria, took place on Tuesday evening, when the aged Dean of Windsor, Dr. Elliott, performed the ceremony.

The quarterly meeting of the visitors to the Lincolnshire County Asylum was held on Friday at the asylum, on Bracebridge Heath, near Lincoln. Mr. Gough of London (Messrs. Giles, Trough, and Trollope) was authorised to proceed with the specifications for the enlargement of the asylum, and to advertise for tenders for the execution of the work. The seal was also affixed to the contract for purchasing 60 acres of land from Mr. Sibthorpe at a cost of £9,500, intended to ask the contributory authorities for £10,000.

The joint Parliamentary Committee on London Underground Railway Schemes have issued a report, in which they discuss the general principles upon which such railways should be constructed, and advocate the appointment of some central authority to control and supervise them.

A brass tablet in memory of Sir Frank Lockwood I was unveiled in Manchester Grammar School on Friday by Mr. Justice Ridley.

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ILLUSTRATIONS.

SELECTED DESIGN FOR THE BLUECOAT HOSPITAL, LIVERPOOL. —BANK AND BUSINESS PREMISES, BIRKENHEAD.—SIDDER- DALE FARMSTEAD, YORKS.—HOUSE AT BIDEENHAM.—BOAT HOUSE, FAIRHAVEN.—CARTMEL PRIORY CHURCH.	
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Our Illustrations.

THE BLUECOAT HOSPITAL, WATVERTREE, LIVERPOOL.
SELECTED DESIGN.

THE drawings here reproduced are those of the accepted design for the new Bluecoat Hospital for Messrs. Briggs and Wolstenhulme, F.F.R.I.B.A., and Messrs. F. B. Hobbs and Arnold Thorneley, A.A.R.I.B.A. The first competition by twelve firms of architects resulted in the selection of a plan which was the subject of a second competition with amended requirements. The design of the gentlemen named was adopted by the trustees. The site of the new hospital is a tract of land, almost in shape, situate at Watvertree. Nearly 73 acres in area, it is adjacent to land on the south side of Watvertree Church, and slopes gently from the west, commanding on the west side an outlook over the Watvertree playground. On the east side the estate is bounded by Church-road and on the west by Prince Alfred-road. About five acres of the site will be occupied by the buildings of the hospital, the remaining 24 acres, on the north side of the area, being reserved for a playing field. The main entrance will be from Church-road. The entrance gates, flanked on each side by a lodge, will lead by a short carriage drive to the main doorway, situate in the basement of the tower, which is 125ft. high, and supports a public clock and bells. From this side the external aspect will be that of a range of one-story buildings, running north and south, terminated by the tower, with, at one extreme, the chapel, and at the other the gymnasium, these buildings, which are higher than the central range, forming two conspicuous wings. The main entrance gives access to a vestibule 17ft. square, on one side of which is the boardroom, and the other the ladies' waiting-room. Beyond the ladies' committee-room, and beyond the boardroom on the other side an applicants' waiting-room, medical examination rooms, &c. The applicants' waiting-room has a separate entrance. Between the chapel and the gymnasium is a corridor 9ft. wide, lighted from the internal quadrangles. Westward from the vestibule a main corridor, 14ft. in breadth, leads to the central hall. This hall, which is 76ft. by 42ft., and 30ft. in height, with windows in both sides, will seat 616 persons. It is designed for recreative lessons and entertainments. At the west end is a platform and retiring room, whilst a bath-room and other apartments are conveniently adjacent. At each side of the platform are stairs leading to the lower level. Beneath the central hall is the dining-hall, of the same dimensions, and 18ft. high; for, although the central hall is the dining-hall, owing to the ground level, the building, owing to the delicacy of the site, admit of a lower ground floor on the west side. On the north side of the central hall and the corridors leading to it is situate the male staff quadrangle, 169ft. by 90ft., and on the south side the female staff quadrangle.

Both quadrangles will be laid out as lawns. Beyond the central hall, and at right-angles to it—that is to say, running north and south—is the main block, which, therefore, has its frontage to the west, overlooking the Watvertree playground. This, the principal facade of the building, will be three stories high. At each end of it, running east and west, will be ranges of buildings of the same height, projecting, however, some 70ft. beyond the west main front. The hospital, consequently, will present from this side the aspect of a spacious central yard surrounded by buildings on three sides, but open to the west. This court, 282ft. by 76ft., will be utilised as a boys' playground. The ends of the two wings are joined by a cloister forming the western boundary of the court, whilst at the north of the playground will be a spacious shelter for use in wet weather. On the lower story of the central building will be, at the north end, two large recreation-rooms for the boys, with a library for the use of the staff in the centre. On the same floor in the wings are in the north wing six large classrooms, a joiner's shop, cloakrooms, &c., for the boys, and in the south wing for girls. The two upper floors are occupied by dormitories, and at the north end the mistresses' sitting and bedrooms. There are four dormitories, with 50 beds each, and two with 25 beds each for boys, and two with 50 beds each and two with 25 beds each for girls, the total accommodation being for 250 boys and 150 girls. These buildings are lighted on both sides, the boys' and dormitories having a central light aspect over the male staff quadrangle. On the east side of the female staff quadrangle are the range of buildings comprising the kitchens and offices, with servants' hall, staff dining-hall, and servants' rooms. On the south side of the buildings are the girls' playground 20ft. by 75ft. It is surrounded by cloisters, connecting the wings, and running the whole length of the central building, is on the lower story a well-lighted corridor, which gives access to the recreation-rooms, the dining-hall, and the central hall. The corresponding corridors on the floors above give access to the dressing and sitting rooms, apartments and dormitories. There are ample stairs on both sides of the building. Every provision has been made for heating, lighting, and prevention of fire. The circular chapel, which will seat 800 workers, has four projecting arms, forming a cross. The entrance is in the north arm: in the south arm is a red brick vestibule with a gallery by a gallery. Under the gymnasium is a swimming-bath, 60ft. by 30ft.; the gymnasium is well lighted and lofty. The buildings are designed, like the existing hospital in School-lane, in the Late Renaissance style, which has been adopted with a view to continuity of design. They are to be built of red brick with facings of white stone. The scheme includes the sanatorium, a separate building placed on a terrace to the north of the main hospital, and on the east of the playing-field, which the sanatorium overlooks. There is accommodation in the wards for twenty boys and sixteen girls, with administrative offices to the eight requirements. The wards will be extremely light, pleasant, and airy. The cost in the original competition was limited to £70,000; but in the final contest £90,000 was determined on. The details and general planning of this scheme are admirable, and the design architectural is a high order of merit. The architect, as the assessor, Mr. Curzon, points out in his report, of improvement, more particularly in the facade towards Prince Alfred-road and in the front facing the playing-fields. The chapel, in the form of an amphitheatre, with galleries in the transepts, makes a striking feature, considerably enhancing the interest of the design.

BANK OF LIVERPOOL, BIRKENHEAD BRANCH.

This building, now in course of erection at Charing Cross, Birkenhead, consists of banking premises and six spacious shops. The banking room is hexagonal on plan with panelled dome ceiling and a central light. The walls are of American walnut. The height of 8ft. 6in. with American walnut. Spacious strong-rooms, clerks' room, lavatories, &c., are provided in the basement. The bank, as far as possible, is of fireproof construction. The shops are cellared throughout, with lavatory accommodation, and on the first floor are the shops. The shops are of Portland and Bathstone and Rowley stone will be used for the dressings, and 2½ wire-cut Runcorn bricks for the facings with brown diaper bricks for gables. The roof to be covered with "Buttermere" dark green slates. The shop windows and entrance

door of East Indian taste. The builders are Messrs. Morrison and Sons, of Watvertree, near Liverpool, and Messrs. Douglas and Minshall, of Chester, the architects.

NIDDEBDALE FARMSTEAD, YORKSHIRE.

This farmstead is situated in the valley of the Nidd about three miles above Pateley Bridge, and is one of several which have had to be removed and rearranged on higher ground owing to the valley being occupied by a large compensation reservoir constructed here by the Bradford Corporation. Gouthwaite Hall, the historic early home of the Yorke family, and also the scene of Eugene Aram's labours as a village domestic, has been raised to the ground, and the materials reused in the erection of this farmstead and other buildings. The block comprises a well-arranged farmhouse (the parlor and chimney being all old ones from Gouthwaite Hall rebuilt), with the various farm buildings grouped around a large fold yard, and connected with the house by concrete footpaths in front, and all quickly accessible from it. The walling is of hammer-dressed local stone with tooled aslar dressings, the roofs being of gable, and the chimneys of Bland and Down, of Harrogate, are the architects.

HOUSE AT BIDEENHAM.

This house, erected in a very pretty and characteristic village in Bedfordshire, has been purposely kept very simple in design, in order to harmonise as far as possible with its setting. The old local tradition of building has been carefully studied beforehand, and followed in the building of the present house. The materials are local "mingled" bricks for the walls, whitewashed, and hand-made local red tiles for the roofs; all the external woodwork is painted green. The gardens were designed by Mr. Curzon, as illustrated in every detail, and in relation and in harmony with the house; but modifications were made in the course of execution. The architects are Messrs. C. E. Mallows and Grocock, 11, Gray's Inn-square, W.C., and Bedford.

BOAT HOUSE, FAIRHAVEN, LUTHER.

This building, from the design of Messrs. H. and W. Wade, of Blackpool, is now in course of erection on the shores of the lake at Fairhaven, near Lytham. The contractors are Messrs. Shepherd and Sons, of St. Anne's-on-Sea. The boat-house itself is 36ft. by 18ft., and the remainder of the building is occupied by a bungalow residence for the manager during the boating season. The arrangements are shown by the accompanying plan.

DOORWAY, CARTMEL CHURCH.

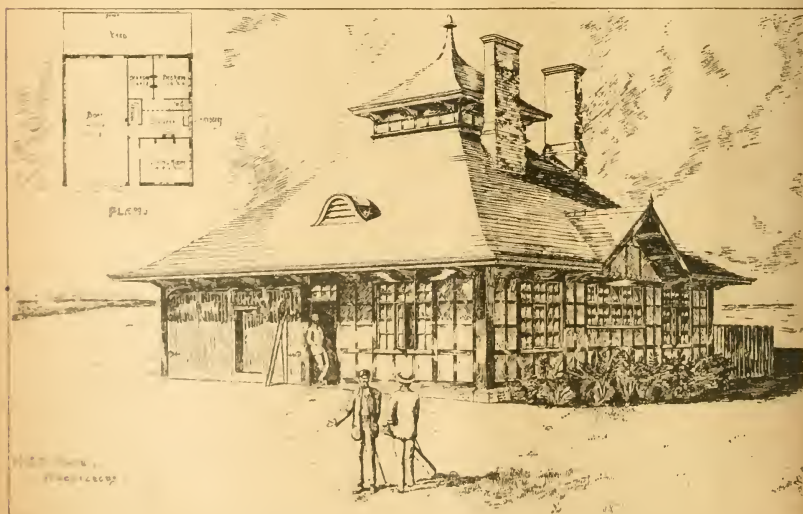
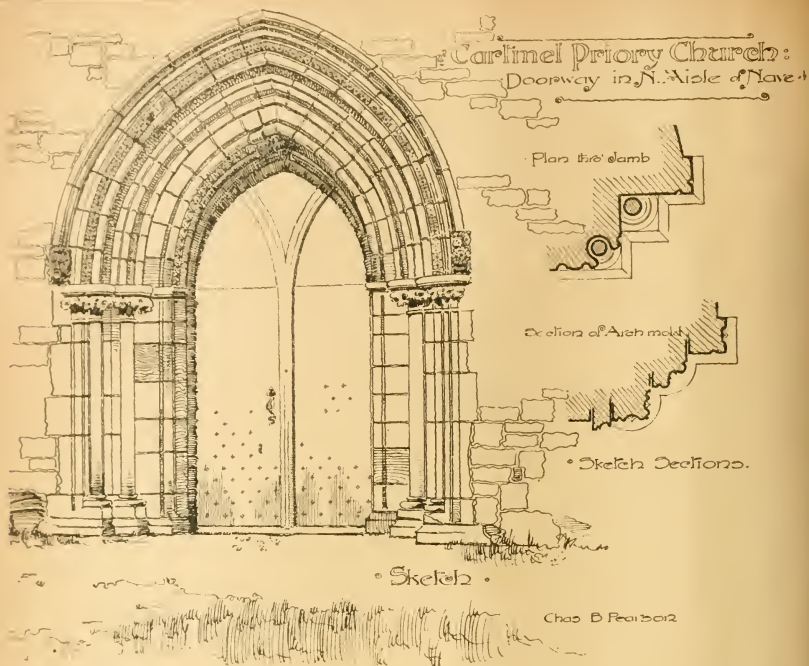
The Priory Church of St. Mary, Cartmel, is situated in the north of Lancashire, not many miles from Lancaster, the county town. It is one of very great interest, and contains examples of almost every style of Gothic architecture. The doorway illustrated is one of the few examples of Early English work to be seen in this church.

The Hon. G. W. Ross (Premier of Ontario), who is now in this country, has placed a commission with Mr. M. Raggi, sculptor, for a statue of the late Queen, which will be cast in bronze and erected in Toronto in the early spring.

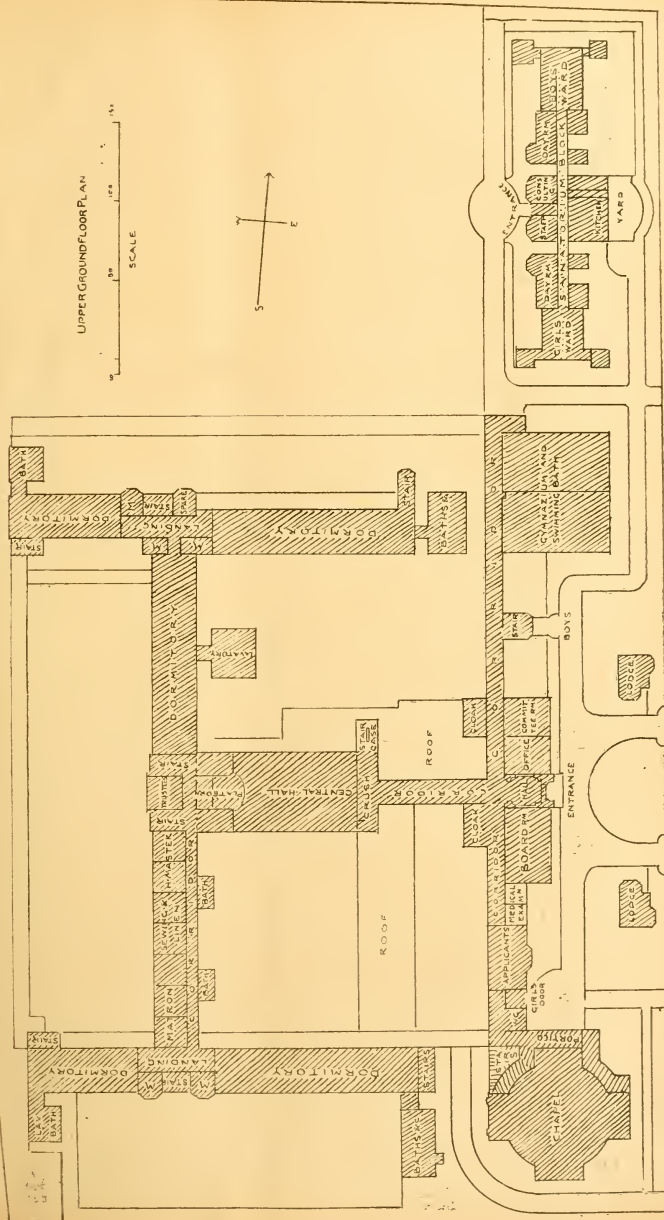
A Parliamentary paper has just been issued giving the amounts paid in each administrative county county borough from Sept. 15, 1898, to March 31, 1901, in respect of the payment of half the rates on the tent-rent-charge under the Tithe Rent-charge (Rating) Act, 1896. The total gross payments in administrative counties for the period was £127,577, £146, and the total net payments £153,523. Among the larger payments were £14,200 in Norfolk, £12,515 in Essex, £9,140 in Kent, and £5,943 in Devon.

The Bishop of Salford laid, last week, the foundation-stone for the Roman Catholic school and church to be erected at St. Ann's, Greenacres, Oldham. The present school premises have been condemned by the Government inspectors, and a new building, including school and church, is being erected at an estimated cost of about £7,000.

Good progress is being made by the Rochdale School Board with the construction of the tramways to Norden, and it is expected that early in 1902 cars will be running over the section of the proposed municipal lines. Between 200 and 300 workmen are engaged, most of them in the vicinity of Spottland Bridge, which is being widened and otherwise improved. Mr. H. C. Hilton is the engineer.



BOAT HOUSE FAIRHAVEN LAKE, NEAR LYTHAM.



SELECTED DESIGN, BLUECOAT HOSPITAL, LIVERPOOL.—MESSRS, BRIGGS AND WOLSTENHOLME AND HOBBS AND HAROLD THORNELEY, Architects.

PARLIAMENTARY NOTES.

WESTMINSTER ABBEY AND THE COMING CORONATION.—Mr. Grettton asked the First Commissioner of Works, on Thursday night, if he was aware that the Dean and Chapter of Westminster Abbey had strongly the opinion that certain stands usually erected in the Abbey for State ceremonies were unsafe, and should not be erected for the forthcoming Coronation, and that they were of opinion that in view of the calamity which would result from the collapse of one stand in particular, he would give the matter his serious consideration. Mr. Alderman Douglas has heard that some members of the Chapter hold this view, but that there is some diversity of opinion among them on the subject. Though it is considered that the stands in question could be erected with perfect security and without damage to the Abbey, in consequence of other objections, altogether distinct from considerations of safety, it is proposed to erect the stand over the Communion-table.

VOTES FOR PUBLIC BUILDINGS.—In the supplementary estimate issued on Tuesday, there are several items of interest for alterations to public buildings. It appears that a total sum of £50,000 is being spent on sanitary improvements, drainage, and other special works, necessary to prepare Buckingham Palace and Windsor Castle for occupation by their Majesties. The amount required before April 1st is £50,000. A further sum of £5,000 is taken for the preparation of the suite of apartments in Kensington Palace, assigned by his Majesty to H.R.H. Princess Henry of Battenberg. It is item for the purchase of materials and repairs to the fabric. A similar sum of £5,000 is required on account of the cost of repairing the damage done to the Legation buildings at Pekin during the siege. Alterations consequent upon the diversion of a portion of the official residence of the First Lord of the Admiralty to departmental uses are to cost £1,350, and £4,650 is asked for to adapt the house No. 16, Queen Anne's Gate, for an official residence for the Senior Naval Lord.

WATER SUPPLY AND SANITARY MATTERS.

HORWICH.—The urban district council of Horwich, a place which has just been on the verge of a water famine, submitted the details of a scheme for the supply of the town with water to Mr. W. O. E. Meade-King, Local Government Board inspector, on July 25. The scheme involves the taking of 45 acres of gathering ground at Wildersmore at a rental of 400 per annum; second, to secure the water rights over 11 acres on Marklands and Stoneycroft estates at a rental interest of 100 per annum; to construct a reservoir on the Marklands estate, for which £12 10s. per acre is to be paid annually. The council asked for a loan of £20,000 for the construction of the reservoir and other works. There was put in a copy of analyses by Dr. Campbell Brown, of Liverpool, which stated that the water proposed to be taken was good for domestic use. Mr. M. W. Todd, engineer, of Bolton, gave details of the scheme that he had prepared, showing that there would be an estimated supply of 283,000 gallons per day. They were under agreements now with the Blackburn Council and a local colliery proprietor to take 150,000 gallons. The scheme without the latter would provide a supply in perpetuity. Mr. Pierce, deputy town clerk of Liverpool, opposed on behalf of the Liverpool Corporation, who had large interests in the waterworks township of Livingston as owners of the waterworks.

WALTONHAMSTON.—The additional two new reservoirs now being erected by the East London Water Company were formally named by the directors on Thursday last week. The existing storage reservoirs are situated at Waltonhamston and are ten in number, having a total area of 319 acres, and a total capacity of 1,200,000,000 gal. The two new reservoirs, which were begun in May, 1899, will, when completed, practically double the capacity, and will be about 180 acres, but as a result of their depth their capacity will be about 1,200,000,000 gal., thus bringing up the previous total to just upon 2,500,000,000 gal. The area is 500 acres and 2,400,000,000 gal. capacity. The water supply for the existing reservoirs is taken from the River Lea just above Chingford pumping station. The new reservoirs are sited on the marsh lands between Ferry-lea and Chingford Mill. They are bounded on the west side by the River Lea navigation, and on the east by Higham Hill. Between the two reservoirs is a small land about 25 acres in extent, which will be given by the company to the Corporation for a recreation ground. As the new reservoirs interfere with the existing course of the River Lea and the navigation, the new cut for the river past the Ferry-lea Mill has been made, and the river will flow into the new cut for the greater part of which the company has formed the necessary wide flood-gates. The new cut has been 11 ft. in the full flow, and 10 ft. in the low water, with a width of 30 ft. at the full flow, and 20 ft. at the low water.

of 30 ft. It will take in the water from the River Lea, and will feed not only the new reservoirs but the old also. Owing to the difference in levels, however, the last 10 ft. of water in the new reservoirs will have to be lifted by pumps. The width of the aqueduct is reduced to 20 ft. after passing the site of the proposed new pumping station, and it is intended to pump 100 million gallons per day, which is one of the existing group. The 30 ft. aqueduct will convey 180 million gallons of water per day up to the intake of the new pumping station, which is intended to pump 100 million gallons per day, when the river is in good flow, into one of the two new reservoirs. The remainder of the water will pass along the 20 ft. aqueduct. The motive power for forcing the pumps will be taken from the Lord Mill, and will consist of two engines and dynamos combined, each of 250 H.P. The reservoirs have been constructed by excavating the land and forming the soil into the shape of the surrounding embankment walls. The level of the bottom of the reservoirs varies in depth from 8 ft. to 12 ft. below the original surface of the land, and the embankments are raised so as to give a depth of about 30 ft. of water. The slopes of the embankments are 4 to 1 inside and 2 1/2 to 1 outside the reservoirs. To render the reservoirs watertight a puddle wall is inclosed within the embankments throughout. A trench was first excavated at the bottom of the London clay, which in the deepest part is about 60 ft. below the ordinary ground level. This trench is filled in with puddle, which is well kept into the land and is brought to the surface at the top of the embankment. Consequently the whole of the water in the reservoirs will be contained inside a puddle wall, the entire reservoir being watertight. The two reservoirs will be connected by a tunnel about 350 yards in length. There will also be a short tunnel for discharging the water into the canal leading to the filter-beds, which are situated at Lea Bridge. The water will be carried out under the supervision of Mr. B. Bryant, the company's engineer, by Messrs. S. Pearson and Son, of Westminster, the contractors. The work of construction is being pushed on, and there is reason to expect that in the spring of next year the reservoirs will be ready to store water for the summer's use. On account of the rapid increase of the population in the company's district it was decided some time ago to make a very large extension to the existing storage reservoirs, which will be completed in 1902. The company, therefore, introduced a Bill into Parliament in 1899 for the construction of 5,000 million gallons of storage, higher up the valley of the Lea. This Bill was rejected, but a second Bill, which was identical Bill was introduced in 1900, and was passed. The scheme, as sanctioned, involves the purchase of upwards of 1,000 acres of land on which to construct the reservoirs, and the bulk of this land has already been acquired.

CHIPS.

A Select Committee of the House of Commons has cleared away the proposal of the Corporation Tramways Bill, which had previously passed through the House of Lords.

The new infirmary at Dorking was opened last Thursday in the presence of a large number of people by Mr. Croft Deverell, the chairman of the board of management. The architect for the new buildings was Mr. H. Percy Adams, F.R.I.B.A., 28, Woburn-place, Russell-square, London.

The Rev. H. Darwin Burton, head missionary for the diocese of St. Albans, and missionary in charge of the St. Albans Church, St. Albans, has just received a gift of £5,000 from the gentleman who the present presents to remain anonymous. At present there is only a chance permanently built, the church being of iron. The new church was built by subscription, and has received £50. On this there is still a debt of over £1,000. The £5,000 is given for the purpose of building the nave, and the work will be commenced at once.

Agricultural depression is clearly not yet a thing of the past. The 12a, 3, 19p. of freehold land at Branton Island, near Lincoln, together with a cottage and buildings, has just been sold by auction at 14s. per acre. This works out at 14s. per yard, to say nothing of the cottage, which is practically thrown in.

Mr. Thomas Edward Knightly, F.R.I.B.A., of 108, Cannon-street, E.C., and Birckbeck Bank Chambers, Chancery-lane, has taken into partnership with Mr. E. J. Harding, of 10, Chancery-lane, F.R.I.B.A., of Birckbeck Bank Chambers. The firm will practise under the style of Knightly and Batterbury at both addresses.

The West Suffolk Hospital, Bury St. Edmunds, and the committee have decided to put the hospital on a new and up-to-date operating theatre, and the committee have decided to put the hospital on a new and up-to-date operating theatre, and the committee have decided to put the hospital on a new and up-to-date operating theatre.

Our Office Table.

THE Queen has given her permission, through her Royal Highness the Duchess of Fife, for a valuable addition to the Passmore Edwards' Library, to be called the "Alexandra Window," and it is possible for these lines by Tennyson to be inscribed:—

Seakings' daughter from over the sea . . .
For Saxons and Norse of Norman we,
Teuton or Celt, or whatever we be,
We are each and all in our welcome of thee,
Alexandra!

When the Duke of Fife laid the foundation-stone this month, it was felt that space had been somewhat sacrificed for a perfectly unique position. It was also more fully realised that the Sailors' Palace, as the international headquarters of the British and Foreign Sailors' Society, would not be complete unless more provision were made for the sons of the old Vikings from Scandinavia, Germany, and all the Norsemen who are destined to be the backbone of the empire, and the sons of Britain in her world-wide commercial empire. The Directors are pleased to announce that not only is an adjoining building happily secured for this purpose, but that Mrs. Sam Lewis, whose husband bequeathed a legacy to the society, has presented to the society an *interior* gallery for the Alexandra Window. The society's acquiring space will also give a small gallery, with its sparkling fountain, which the good superintendent of Victoria Park, famed for its flower-beds, will be made the most of as a veritable oasis for the Mercantile Dock. It is estimated that the additional cost of this valuable extension will be some £3,000. The lines of that great volume extended to her Majesty in 1863 will illustrate the spirit in which these strangers coming to our shores in the years to come will be met in the Passmore Edwards Sailors' Palace.

The thirteenth annual meeting of the Society of Art Masters was held on Wednesday in the Lecture Hall of the Royal College of Art, presided over by Mr. F. Sholey (chairman) presiding. The chairman, in his annual address, referred to the effect of the Cockerell judgment on schools of art, and went on to allude to the limitation of art teaching in elementary schools, the College of Art, the restriction of art to the technical schools, and the importance of the national art competition, and other matters of special interest to art teachers. In conclusion he expressed regret that a large number of masters failed to recognise the usefulness of the association as a centre of united effort. The council regretted that students of the Royal College of Art no longer participated in the national competition, and therefore it would not in future be possible to compare their work with that of students from other parts of the country.

The Battersea Polytechnic are intending to extend their day technical courses for next session, commencing in September, to include a course suitable for lads entering the offices of architects, quantity surveyors, sanitary and municipal engineers. The course will be arranged to extend over two years, and will include the subjects required for the preliminary examination of the Royal Institute of British Architects, in addition to instruction in more distinctly technical subjects and art. The course will be intended for boys proposing to take the more professional and higher parts of the work as distinct from the existing artisan courses in building, which are intended to give lads some technical and practical training before entering building offices.

MR. SOMERS CLARKE, the surveyor of St. Pauls recently announced that there are numerous fissures in the walls of the cathedral. It now appears that the authorities, realising the critical condition of the edifice, are taking steps to ascertain the precise reason of these cracks. The cathedral authorities—Mr. E. J. Harding, clerk of the work states, are doing everything in their power to lessen the evil caused by the withdrawal of moisture from the clay—occasioned by public works in the vicinity. One of the windows in the south transept, and the wall which is outside of it, are the worst affected. The windows in the north transept, and the wall which is outside of it, are slightly buckled, and underneath are several cracks; while on the corresponding side, there are similar fissures, and in addition the cornice beneath has "settled down" at one end. Strong ties have been fixed in the walls on either side, and, as the results of the movements

Alumet, brick	150 0 0	200 0
STONE.		
Darley Dale, in blocks	per foot cube	2 21
Red Mansfield ditto	per foot cube	2 21
Hard York ditto	per foot cube	2 10
Ditto ditto 6 in. sawn both sides, landings,	per foot cube	2 8
random sizes	per foot cube	2 8
Ditto ditto 3 in. slabs saw two sides,	per foot cube	2 3
random sizes	per foot cube	2 3
Hopton-Wood (Hard Bed) in blocks, per foot cube	per foot cube	2 3
Ditto ditto 6 in. ditto saw both sides,	per foot cube	2 6
landings, random sizes	per foot cube	2 13
Ditto ditto 3 in. ditto	per foot cube	2 0
Portland, White Bed	per foot cube	2 0
Ditto Base Bed	per foot cube	2 21

* All F.O.R. London.

OILS.		per ton	£32	5	0	to £32	10
Linsced		per ton	27	5	0	27	5
Expessed, English pale		"	27	5	0	27	5
Do, brown		"	26	5	0	26	5
Cottonseed, refined		"	24	5	0	25	0
Olive, Spanish		"	38	0	0	40	0
Seal, pale		"	26	10	0	26	10
Do, Ceylon		"	25	0	0	25	0
Do, Ceylon		"	25	10	0	26	10
Palm, Lagos		"	25	10	0	25	10
Oleine		"	17	5	0	18	5
Lubricating U.S.	per gal.	0	7	0	0	8	0
Petroleum, refined		"	1	0	0	1	0
Do, kerosene	per gallon	1	6	0	1	6	0
Do, Arckhol		"	0	19	6	1	5
Turpetine, American	per ton	37	0	0	37	5	0

White Sea	11	0	0	22	5
Battens, all sorts	5	0	0	12	10

Battens, all sorts	3	6	5	12	10
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LIST OF COMPETITIONS OPEN.

Leobach—Auctions to August.		The Rev. T. Houghton, Ecclesfield Vicarage, Sheffield.	Aug. 31
Pennance—Laying-out Ground in Western Thames made.	£21 merged, £10 10s.	T. R. Cornish, Town Clerk, Public Buildings, Penzance.	Sept. 1
Penrhyn—Laying-out Land at Gwent.	£30, £15, £5	The Borough Surveyor, Town Hall, Blackpool.	Sept. 16
Carlisle, S.W.—Public Buildings.	Pages, merged, 50s., 32s.	The Public Health Committee Office, 11, King's-rd., Chelsea, S.W. Oct. 1	
Camberwell, S.E.—Baths and Wash-house. Old Kent-road.	10s., 7s., 5s.	The Town Clerk, Town Hall, Camberwell, S.E.	23
A. Saxon Hall, F.R.I.B.A., Assessor.		John Gammage, Borough Surveyor, Town Hall, Dudley.	
Dudley—Twenty Women's Dwellings.		The Rev. G. E. Les, Rector, St. Peter, Peter Port, Guernsey.	
St. Peter Port, Guernsey—School 750 places.		F. H. Webb, U.D.C. Clerk, Town Hall, Tynes.	
Waltham-Thames—Municipal Buildings, Fire Station, &c.	£30, £20, £10 10s.	Thomas Evans, 102, Cathedral-road, Cardiff.	
Cardiff—Chapel, Cathedral-road, west corner.			

LIST OF TENDERS OPEN.

BUILDINGS.

Ashton-in-Makerfield—B.R. Port-House, &c.	Urban District Council	Albert Sykes, Clerk, Council Offices, Ashton-in-Makerfield.	Aug. 3
Upper Mains of Urchley—Sleeping-room.	Miss Mary Davies	Jenkins and Marr, Architects, 16, Bridge-street, Aberden.	3
Merthyr Tydfil—Premises, High-street.		E. M. Rees Vaughan, F.R.I.B.A., Cardiff.	3
Below—Farmhouse.		Henry Maddox, F.I.A.S., Penzance.	3
Albermarle—Thirty-one Houses.		T. W. Millar, Architect, Mountain Ave.	3
Lower Longford—Infants' Schoolroom, &c.		D. L. Jones, Architect, 10, West End, Llanelli.	3
Cardiff—Additions to Jewell's Shop.		Chorley, Common, and Chorley, Architects, 15, Park-row, Leeds.	3
Stampton—Repairs.		Thell and Sant, 6, Arcade Chambers, Cardiff.	3
King's Lynn—Additions to Naval Reserve Public-House.		Jenkins and Marr, Architects, 16, Bridge-street, Aberden.	3
Albermarle—Barn, &c., at Taverham.		Herb. Tison, Architect, Railway-road, King's Lynn.	3
Leamington—Shops and Houses, Linnavay-road.		Davidson and Garden, 12, High-street, Aberdeen.	3
Chilcompton, Somerset—Pumping Station.		D. Conroy, Architect, 2, Bisket-street, Londonbury.	3
Girlington—Enlarging Three Shops.		W. F. Bird, C.E., Market Hall, Midsummer Norton, Somerset.	3
Barnes—Six Houses and School.		Overbury and Son, Architects, 18, Tynel-street, W. London.	3
Aberdeen—Alterations to Farm Offices, Folia Smity.		Senior and Clegg, Architects, 15, Regent-street, Barnsey.	3
Birkenhead—Barracks, &c.		Davidson and Garden, 12, Dees-street, Aberden.	3
Little Tack of Burnack—Repairs.		Grand and F.R.I.B.A., 2, High-street, Aberden.	3
Aberdeen—Rebuilding Business Premises, Cannon-street.		J. Masters, 81, Mary-street, Cardiff.	3
Ballyharren—Curate's Residence and Out Offices.		G. F. Wood, Downham, Norfolk.	3
Lougher—Rebuilding Hydro Independent Chapel.		P. Beary, Abbeyside, Dungarvan.	3
Ranger, Ireland—Hydro at Strickland's Glen.		Thomas Arnold, C.E., Castle Buildings, Llanelli.	3
Ayr—Town Hall.		John Russell, C.E., Architect, 22, Waring-street, Belfast.	3
Newport, I.W.—Library and Technical Institute.		J. K. Hunter, Architect, 51, Sandgate, Ayr.	3
Spilby—Two Villas, Handley-road.		F. Newman, Council Surveyor, St. Thomas-street, Ryde, I.W.	3
Leigh—Covering Wall at Gasworks.		Robins and Foley, Architects, Castle Park, Chelmsford.	3
Chelmsford—Repairs, &c., at Union House, Wood-street.		P. Thomas, Town Clerk, Town Hall, Leigh, Lancs.	3
Landover—Alterations to College.		W. W. Duffield, Clerk, 38, High-street, Chelmsford.	3
Willesden Green, N.W.—Additions to Public Library, High-rd.		Jenkins and Marr, Architects, 16, Bridge-street, Aberden.	3
Tonquay—Gasworks Extensions.		O. Claude Robson, M.I.C.E., Public Offices, Dynevor, Kilburn, N.W.	3
Belfast—Additional Workhouse Infirmary.		Francis Chalmers, Manager, Town Hall, Ince, Lancs.	3
Longhoughton—Five Labourers' Cottages.		Gung and Mackenzie, Architects, 10, Queen's Quay, Belfast.	3
Grimsby—Additions to Mans.		Henry Powell, Architect, Loughlington, Ince.	3
Merthyr—One Hundred Cottages at Penydarren.		R. V. Dickie, 31, Queen's Quay, Belfast.	3
Trematham—Additions to Isolation Hospital.		John Vaughan, Clerk, Town Hall, Merthyr.	3
Aberkane, Yorkshire—Additions to Parish Church.		C. Jones, Surveyor, Town Hall, Teignmouth.	3
Bury St. Edmunds—Additions to Suffolk General Hospital.		G. Hodgson Fowler, Architect, The College, Durham.	3
West Hartlepool—Stabling, Loose Boxes, &c.		H. Percy Adams, F.R.I.B.A., 28, Woburn-pl., Russell-square, W.C.	3
Gravelock—English, Burgh.		William Bell, Architect, York.	3
Normanton-on-Soar—Additions to Board School.		W. H. Thompson, Engineer, Hunter-place, Greenwich.	3
Ely—Schools.		Barrowcliff and Alcock, Architects, Loughborough.	3
West Hartlepool—Offices and Stores, Middleton-road.		Edgar Dowd, A.R.I.B.A., 31, High-street, Cardiff.	3
London—Thirty-two Shops and Houses, Regent-rd.		Henry Lord, Architect, 12, Denagate, Manchester.	3
Pontyfron—Repairs at Windsor Hotel.		James and Morgan, Architects, Church-street Chambers, Cardiff.	3
King's Lynn—Workhouse Infirmary, Exton-road.		Chas. Smith and Son, Architects, Reading.	3
Ynysyrr—New Club.		O. Evans, Architect, Pontyfrid.	3
Roundhay, Leeds—School-Hall, &c.		W. H. Bevers, A.R.I.B.A., Architects, 25, Bond-street, Leeds.	3
Sale—Meteorological and Clerk Tower.		G. M. Beath, M.I.C.E., 6, Montague-road, Sale.	3
Wolverhampton—Alterations to Monmore Green Schools.		T. H. Fleming, Architect, 102, Darlington-street, Wolverhampton.	3
Saltham—House, Marine Parade.		E. E. Whigham, A.R.I.B.A., 26, High-street, Stockton-on-Tees.	3
Museburgh—Municipal Buildings.		Lytle and Constable, 3, Bull-street, Edinburgh.	3
Hoyle—Stables, &c.		T. Foster, Engineer, Council Offices, Hoyle.	3
New Brighton, Kent—School, 1,230 places.		H. Leighton Pearson, A.R.I.B.A., 27, Chancery-lane, W.C.	3
Bewell—School.		J. W. Thompson, Architect, 63, Gray-street, Newcastle-on-Tyne.	3
Sesban Harbour—Offices, Dredging House, Workshop, &c.		Wm. and T. R. Milburn, Architects, 20, Fawcett-street, Sunderland.	3
Gravelock—Electric Light and Destructor Buildings.		F. T. Grant, Borough Surveyor, Town Hall, Gravelock.	3
Longhoughton—Converting Building into Art Classes, &c.		J. Anderson, Supt. of Works, 20, York-place, Edinburgh.	3
Stirling—Public Library.		Lesells and Taylor, Architects, 74, Young-street, Edinburgh.	3
Burghall—Four Attendants' Cottages.		Alfred Dwyer, Council Surveyor, Shire Hall, Hereford.	3
Mandy, near Cardiff—Additions to Schools.		G. E. Halliday, Architect, 14, High-street, Cardiff.	3
Burghall—Two Officers' Cottages.		Alfred Dwyer, Council Surveyor, Shire Hall, Hereford.	3
Great Marlow—Additional School Buildings.		R. M. Mills, Secretary, Council Offices, Hereford.	3
St. Kennington—Superstructure of Royal College of Science.		The Secretary, H.M. Office of Works, Store's Gate, S.W.	3
Redruth—Offices and Stores.		Sampson Hill, Architect, Green-lane, Redruth.	3
Fulham Palace-road—W.C.—Additions to Workhouse.		John Russell, F.R.I.B.A., 27, Chancery-lane, W.C.	3
Chelmsford—Labourers' Cottages.		E. Whitmore, Architect, 17, Duke-street, Chelmsford.	3
Waltham-Thames—Stables, Cart Shed, Cottage, &c.		G. C. Jenkins, A.M.I.C.E., Council Offices, Walton-on-Thames.	3
Penrith—Dock—Twelve-Storey School, Myer-street.		G. Morgan and Son, Architects, 24, Kings-street, Carmarthen.	3
Whitchurch—School.		R. & S. Williams, Architects, Burgh Chambers, Wharfedale, Cardiff.	3
West Dundry—Carpenter's House.		T. Cartwright, Post Chambers, Market.	3
Batley—Electricity Works.		Leary, Clanchair, and Sillar, Architects, 2, Queen Anne's-gate, S.W.	3
Heath—Carpenter's Shop.		W. Banks, A.M.I.C.E., City Surveyor, Guildhall, Rochester.	3
Catling, S.W.—Two Teachers' Houses, Church-lane.		J. A. Smith, Architect, 1, Chancery-lane, 4th, Anne's-gate, S.W.	3
Walsell—Electric Light Station, Church-street.		B. Ball, A.M.I.C.E., Borough Engineer, Town Hall, Nelson.	3
Walsell—Municipal Offices and Town Hall, Laidlaw-street.		S. H. Gibson, Architect, 4, Gray's Inn-square, W.C.	3
Walsingham, W. Norfolk—Two Teachers' Houses, Church-lane.		The Borough Surveyor, 1, Hall, Walsingham, W.	3
Walsingham—Two Teachers' Houses, Church-lane.		C. J. Wilson, 102, Tordun-road, Burnley.	3
Walsingham—Two Teachers' Houses, Church-lane.		Willie Wrigley, Architect, 6, Westgate, Wakefield.	3
Walsingham—Two Teachers' Houses, Church-lane.		B. H. Walley, Architect, 1, Hall, Walsingham, W.	3
Walsingham—Two Teachers' Houses, Church-lane.		C. J. Wilson, Worsbourn Estate Office, Burnley.	3
Walsingham—Two Teachers' Houses, Church-lane.		T. Taylor Scott, Architect, 43, Louth-street, Carlisle.	3
Walsingham—Two Teachers' Houses, Church-lane.		J. Archibald Forbes, Architect, 6, Guildhall Chambers, Exeter.	3
Walsingham—Two Teachers' Houses, Church-lane.		J. Broadmore, St. Mary Bourne, Andover.	3
Walsingham—Two Teachers' Houses, Church-lane.		H. Alcock, Architect, Rutland Chambers, Nottingham.	3
Walsingham—Two Teachers' Houses, Church-lane.		Geoffrey and Cressall, Architects, Victoria Chambers, Colchester.	3
Walsingham—Two Teachers' Houses, Church-lane.		T. H. Barker, Fincham.	3
Walsingham—Two Teachers' Houses, Church-lane.		H. Alcock, Architect, Architects Buildings, Nottingham.	3
Walsingham—Two Teachers' Houses, Church-lane.		J. Harding and Son, Architects, 38, High-street, Salisbury.	3
Walsingham—Two Teachers' Houses, Church-lane.		John Walker, North Arch House, Northallerton.	3
Walsingham—Two Teachers' Houses, Church-lane.		E. Beattie and Son, Architects, 1, Vale-street, Salisbury.	3
Walsingham—Two Teachers' Houses, Church-lane.		A. N. Bromley, Archt., Prudential Buildings, Queen-st., Nottingham.	3
Walsingham—Two Teachers' Houses, Church-lane.		H. Lingen-Barker, Architect, 146, St. Owen-street, Hereford.	3
Walsingham—Two Teachers' Houses, Church-lane.		M. Walker, 1, Sandwell-terrace, Walsley, Hereford.	3
Walsingham—Two Teachers' Houses, Church-lane.		C. P. Ayes, Architect, Burvale, Walford.	3
Walsingham—Two Teachers' Houses, Church-lane.		S. L. Gaffield, Pontiferry, Walsley.	3
Walsingham—Two Teachers' Houses, Church-lane.		The Nunnery Colliery Co., Ltd., Iron Exchange, Sheffield.	3
Walsingham—Two Teachers' Houses, Church-lane.		T. Holliday Richardson, Architect, Hemsworth, near Wakefield.	3
Walsingham—Two Teachers' Houses, Church-lane.		J. Mannde, Builder, Tongue-road, New Wortley, Leeds.	3
Walsingham—Two Teachers' Houses, Church-lane.		John Glenn, Engineer, 1, Queen Victoria-street, E.C.	3
Walsingham—Two Teachers' Houses, Church-lane.		Walter E. Richardson, Architect, Rothwell, Leeds.	3
Walsingham—Two Teachers' Houses, Church-lane.		S. East-street, Andover.	3

BUILDINGS—*cont'd.* cont'd.

Aginal—Five Rooms House		P. Puleston, 50, Upper Parliament-street, Nottingham
Asling—Public Library	Public Library Committee	Tessels and Taylor, Architects, 7A, Young-street, Edinburgh
Averpool—One Hundred Cottages		Miles and Surberland, Ltd., 8, South-street, Liverpool
Avonford—Additions to Grammar School		S. R. Stevenson, Architect, 12, Burns-street, Nottingham
Avonford—Schools	School Board	Law and Allen, Architects, Dacre House, Arundel-st., Strand, W.C.
Barnham—Additions to Ekeles Hotel		Arthur Hill, B.E., M. R. I. C. A., 32, George-st., Cork
Barnham—New House		The Naval College Co., 1837, Ltd., Penryn-gate
Barnham—Rebuilding Golden Ball	R. and P. Hartley	Settle and Farmer, Architects, Dalton
Barnham—Additions to Farmhouse		Ellis, Son, and Bowdler, Surveyors, Leicester
Barnham—Cruce—Vicarage		G. Moxham, Architect, 29, Castle-street, Swansea
Barnham—Indicite, Lanes and Shops	Earl of Wiltton's Trustees	James Sellers and Son, Architects, Union Chambers, Bury, Lancs.
Barnham—Indicite, Lanes—Vicarage		Hans F. Price, Architect, Weston-super-Mare
Barnham—Cruce—Premises	Public Benefit Boat Co.	Silvanus Treval, Architect, Truro
Barnham—Worleston—Two Cottages	Grangemouth Parish School Board	G. Howard, Prov. Heath, Worleston, near Guildford
Barnham—Worleston—Twenty Cottages		Alexander Gould, Architect, Weston-super-Mare
Barnham—Worleston—Additions to No. 8, George-street	J. F. Elye	The North Wallfoote Coal Co., Ltd., A. Exchange Buildings, Newcastle
Barnham—Worleston—Additions to Nursery		Freeman, Son, and Gossall, Architects, 47, Farnley, Lincoln
Barnham—Buildings at Gasworks	Malton Gas Co.	Jackson and Fox, Architects, 7, Radon-street, Halifax
Barnham—Additions to Private Hotel, Albert-street		Henry Thoby, Engineer, Castlegate, Malton, Yorks.
Barnham—Additions to Premises, Newmarket	James Storcar	J. T. Franklin, Architect, 2, Rugby
		H. J. Davies, and Sons, Architects, Negate-street, Chester

ELECTRICAL PLANT.

Dundas—Condensing Plant	Gas Commissioners	W. H. Titterton, City Elec. Eng., Duhoise Crescent-1st, Dundee	Aug. 5
Jalghata—Electric Lighting of Asylum	Brecon and Radnor Jt. Asylum Com.	G. Ghes, Gough, and Trollope, Archts., 25, Craven-st., Strand, W.C.	5
Partick—Wiring	Provost and Councillors	M. S. Donaldson, Town Clerk, 57, West Scotland-st., Glasgow	6
Partick—Gas Turbine—Electric Lighting to Three Schools	School Board	C. M. Shingler, A.R.I.B.A., 3, Bond-onion, Walbrook, E.C.	6
Salford—Switchboard	Corporation	W. G. Phillips, Borough Engineer, 10, St. John's Bldgs., Cardiff	6
Teuchies—Seventy Electric Lamps and Section Pillars	Electricity Committee	E. E. Hughes, Secretary, Electrical Depart., Town Hall, Manchester	7
Wigan—Motors and Starters (One Year)	Corporation	H. Collins Bishop, Electrical Engineer, Bradford-place, Wigan	10
Worcester—Electrical Plant	Corporation	C. J. Sutherland, City Elec. Engineer, Guildhall, Worcester	23
Amsterdam—Electrical Tramcars, &c.	Municipality	The Director, Municipal Tramways, Nieuwe Achtergracht, No. 164, Amsterdam	Sept. 1

ENGINEERING.

Andersen—Exhaust Pipes, Dickinson-st.	Electricity Committee	F. E. Hughes, Secretary, Town Hall, Manchester	Aug. 3
Lequette, Viscay—Harbour Works	Wyeombe Union Guardians	The Public Works Department, Madrid	" 3
Launderton—Hot-Water Circulating Boiler at Workhouse	Wyeombe Union Guardians	M. L. Reynolds, Clerk, 12, Easton-street, High Wycombe	" 3
Abbeydale—Steam Station, 3 to 10 ton	Renfrew District Committee	R. Gordon Nicoll, Harbour Engineer, Glasgow	" 3
Paisley—Laying Cast-Iron Pipes, 2,000 yards	Renfrew District Committee	J. Murray, E.C., Master of Works, County Buildings, Paisley	" 3
Campbelltown—Water-Plant Works	Horncastle Rural District Council	GEO. Gordon and J. C. E. Inverness	" 3
Boothferry—Laying Binding Bridle Bridge	Corporation	Henry White, District Engineer, Horncastle	" 3
Torquay—Gasworks Plant	Corporation	Francis Chalmers, Manager, Town Hall, Torquay	" 3
Cardiff—Tramcars	Guardians	A. Ellis, Electric Engineer, Old Post Office Buildings, Cardiff	" 3
Whitehaven—Artificial Steam Boilers at Workhouse	Guardians	W. H. Atkinson, Chief Engineer, Hall, Whitehaven	" 3
Blairgowrie—Water Supply, Ardbair Estate	Guardians	Anderson, Chapman, and Co., Solicitors, Blairgowrie	" 7
Exchange—Cooking Apparatus	Urban District Council	Charles Woodbridge, Clerk, 38, High-street, Uxbridge	" 7
Leam, Spain—Disposal Works	Urban District Council	The Office of Municipal Works, Leam, Spain	" 7
Dons—Sewage Disposal Works	Bengal-Nagpur Railway Co., Ltd.	H. H. H. Swiney, M.L.C.E., Avenue Chambers, Belfast	" 8
London, E.C.—Girdler Bridges, &c.	Urban District Council	The Company's Office, 183, Gresham House, E.C.	" 8
Leamington—Cooking Apparatus	Docks Committee	Henry B. Longley, Engineer, Moss Side, Manchester	" 8
Bristol—Grain Elevator	Gas Committee	W. W. Squire, Eng., Engineer's Office, Cumberland House, Bristol	" 9
Leigh, Lancs—Coke Elevator	Urban District Council	J. Foster, Engineer, Gasworks, Leigh, Lancashire	" 9
Walsley—Water-Works	Urban District Council	Reginald Ross, J. F. F. Corn Exchange Chambers, Newport, Mon	" 9
Knaresborough—Pump at Waterworks	Chipping Campden R.D.C.	S. Turner, Surveyor, Knaresborough	" 9
Shipston-on-Stour—Main Drainage and Water Supply	H. H. Marriot, Son, Desales	N. Ratley, A.M.L.C.E., 16, George-street, Westminster	" 9
St. Albans—Water-Works	Orsett Rural District Council	H. H. Marriot, Son, Desales	" 10
Stanford-le-Hope—Pumping Machinery	Rural District Council	R. F. Grantham, M.L.C.E., 23, Northumberland-avenue, W.C.	" 10
Aberegheny—Stone Arch Bridge to carry Road	Urban District Council	John Gill, Surveyor, 1, Brecon-road, Aberystwyth	" 10
St. Helens—Steel Tank for Gasholder	Urban District Council	W. L. Loucas, A.M.L.C.E., 1, Faldes-street, Bolton	" 10
St. Helens—Pipelining 5 miles	Town Committee	The Gen. Manager, Water Dept., St. Peters, Church Side, Nottingham	" 12
Tridreley—Steel Tank for Gasholder	Urban District Council	The Engineer, Gasworks, Tidydeley	" 12
Stanford-le-Hope—Sewage-Disposal Works	Orsett Rural District Council	R. F. Grantham, M.L.C.E., Northumberland-avenue, W.C.	" 12
Aberdeen—Tunnel, Sewer &c.	Town Council	W. Dyack, M.L.C.E.,burgh Surveyor, Town House, Aberdeen	" 12
Newport, Mon.—Mainlaying (Three Years)	Corporation	T. B. Hildred, A.M.L.C.E., Engineer, High-street, Gosport	" 12
Fenny Stratford—Wage Disposal Works	Waterworks Committee	John Chadwick, Fitter, Gosport	" 12
Jersey—New Service Reservoir (4,000,000 gal.)	Gas Committee	Hamlet Roberts, Engineer and Manager, Town Hall, Ipswich	" 12
Wigan—Stoking Machinery	S. Laneshire Electric Traction Co.	Harold Jones, Town Clerk, Wigan	" 12
Wigan—Large Milling and Grinding Pans at Asylum	East Indian Railway Co.	The Resident Medical Officer, District Asylum, Sigo	" 12
Liverpool—Winding Bridges	Newcastle-upon-Tyne Municipal Council	Kincaid, Waller, and Manville, Engineers, Great George-st., S.W.	" 20
London, E.C.—Goods Engines and Tenders	Metropolitan Asylums Board	C. W. Young, Secretary, Nicholas-lane, E.C.	" 20
Long Reach, near North—Repairing Dolphins	Electric Lighting Committee	S. Courtney, Engineer, 10, Victoria Chambers, Westminster	" 20
Middleborough—Mechanical Cold-Handling Plant	Electric Lighting Committee	T. Ducombe Mann, Clerk, Offices, Embankment, E.C.	" 20
Manchester—Refuge Destroyers	Bunish Ministry for Public Works	R. Hammond, M.L.C.E., 64, Victoria-street, S.W.	Sept. 3
Havana—Sewerage System, &c.	Provision	E. Hammond, M.L.C.E., 64, Victoria-street, S.W.	" 3
Copenhagen—New Incinerators	New South Wales Government	W. J. Bardon, Chief Engineer, City of Havana	Oct. 25
Sydney—New Water Works—Harbour Bridge	Provision	Statensvaesnes Kontor, Revientevsgrade, 10, Copenhagen	Dec. 31
		The Agent-General for New South Wales, 9, Victoria-street, S.W.	Feb. 1

FENCING AND WALLS.

Bradford—Walls and Railings, Wyke Recreation Ground	Corporation	F. E. P. Edwards, A.R.I.B.A., City Architect, Chapel-Lane, Bradford Aug.
Mains of Barrack—Pointing Walls		Jenkins and Marr, Architects, 16, Bridge-street, Aberdeen
Baby—Wrought-Iron Fencing at Workhouse	30 yards	Dunester Union Guardians
Halliday—Cast-iron Fencing		Improvement Committee
Fenton—Post and Rail Fencing (23) sets		James Lord, A.M.I.C.E., Surveyor, Fenton
		F. E. Nicholson, Clerk, Baby, Yorks
		James Lord, A.M.I.C.E., Surveyor, Fenton
		S. A. Goodall, Surveyor, Town Hall, Fenton

FURNITURE AND FITTINGS.

Ladywell, S.E.—Furniture to Infirmary	St. Olave's Union Guardians	E. Pitts Fenton, Clerk, Union Offices, Tooley-street, S.E.	Aug. 3
Downpatrick—Furniture and Fittings, County Council Offices.		R. Pitts MacIlwaine, Secretary, Court House, Downpatrick	—

PAINTING.

Averycham, Wales—Gas Lamps and Fountains	Pontnewynydd Urban District Council	W. H. Y. Bythorn, Clerk, Pontpool	Aug. 3
Harrowgate—Police Convalescent Home		Chas. Clavon, Clerk, Chorley, Architects, 15, Park-row, Leeds	9
Blackburn—Hospital, Finnington		W. Stubbs, A.M.I.C.E., Boro Eng. Victoria-street, Blackburn	3
Liverpool—Police Station, Britannia Hill		J. Haeger, Valence-st., Parrish Offices, Liverpool	3
Chelmsford—Union House, Wood-street		W. W. Duffield, Clerk, No. 6, High-street, Chelmsford	3
London—Vernon Park and Andrew's-square		John Atkinson, A.M.I.C.E., Boro Eng. Victoria-street, Stockport	3
Barnesy—Workhouse, Infirmary, and Prisons		C. Crawshaw, Clerk, 18, Market-street, Barnet	7
Bakenborough—School, Schoolhouse, and Outbuildings		C. Hewell, Chairman, Bakenborough, Sheffield	7
Otmoor—Mansion-house		B. Dickie, St. Quintin's, York	7
Lambeth, S.E.—Infirmary, Brook-street		W. Thurnall, Clerk, Brock-street, Kennington-road, S.E.	7
Cardiff—Cardiff Bridge and Wood-street Bridge		William Harper, M.I.C.E., Town Hall, Cardiff	7
Salford—Infirmary and Union Office, Eccles New-road		James and Morgan, Solicitors, Charles-street, Cardiff	7
Leeds—Infirmary and Nurses' Home, Beckett-street		F. Tuxson, Clerk, Union Offices, Eccles New-road, Salford	7
Musburgh Municipal Buildings		James H. Ford, Clerk, South Parade, Leeds	7
Bewsey-School		Lyle and Coatsworth, Engineers, Edinburgh	7
Manchester—Underground Lavatories		J. W. Thompson, Architect, 61, Gray-street, Newcastle-on-Tyne	7
Edinburgh—City Council Buildings		The City Surveyor, Town Hall, Manchester	7
Marburygh—District Asylum		Anderson, Surveyor, 2, York-st., Edinburgh	7
Newhaven—Workhouse		John T. Brick, Acting Clerk, Asylum, Marburygh, Ireland	7
Nelson—Barricade Station		H. Curtis Card, No. 10, North-street, Levens	7
Worth, Kesteven—Ten Houses and Shops		R. Bull, A.M.I.C.E., Borough Engineer, Town Hall, Nelson	7
Darlington—Eight Houses, Fountain-street		F. E. Drury, 50, Queen's-road, Kesteven	7
Darlington—Workington Bridge		Pearson and Anderson, 10, Rine-clause, Morley	7
		The Rev. Canon Headlam, Whorlton Hall, Darlington	7

PLUMBING AND GLAZING

Ayr—Town Hall	J. K. Hunter, Architect, 51, Sandgate, Ayr	Aug.
Swinton—Renewing Gutters at Schools	A. J. Margrave, Architect, 23, Strutt-street, Manchester	" 12
Reading—Public Library	Lesells and Taylor, Architects, 74, Young-street, Edinburgh	" 13
Parsonage-Walk	Alex. Holland, Town Clerk, Town Hall, Portsmouth	" 21
Stirling—Public School	A. Gould, Architect, Vicar-street, Falkirk	

George Hall, A.M.I.C.E., Surveyor, Town Hall, Bechill	Aug. 1
E. A. Stoddard, Borough Engineer, Alma-road, Windsor	"
D. Mackay, J. B. & Co., Surveyors, 10, St. James's Place	"
Richard Garthley, Surveyor, Langley Moor, near Durham	"
Davison and Garden, 12, Dees-street, Aberdeen	"
James Johnstone, J. B. & Co., Surveyors, 10, St. James's Place	"
George Hall, A.M.I.C.E., Surveyor, Town Hall, Bechill	"
C. R. Pusey, Borough Engineer, Town Hall, Tolmudrom, Yorks.	"
John Bonnington, J. B. & Co., Surveyors, 10, St. James's Place	"
C. T. Johnson, Borough Engineer, Town Hall, Thornaby-on-Tees	"
The Company's Engineer, Buchanan-street Station, Glasgow	"
Robert Hutchison, Surveyor, Poplar-road, St. Georges	"
W. J. H. Cheate, Civil Engineer, 10, St. James's Place	"
R. R. Lathorne, Town Clerk, Municipal Offices, Southampton	"
H. Hall Par, E. C. Surveyor, Council Offices, St. Aldon	"
Henry Stinchcomb, J. B. & Co., Surveyors, Manchester	"
Thomas Clegg, Borough Engineer, Town Hall, Warrington	"
The Direction du Service Speciale, 1, Square Stephanie, Odense	"
William Hetherington, J. B. & Co., Surveyors, 10, St. James's Place	"
M. H. Sykes, Borough Engineer, Town Hall, Stockton-on-Tees	"
The City Engineer's Office, Municipal Buildings, Leeds	"
W. H. Weston, J. B. & Co., Surveyors, 10, St. James's Place	"
The Borough Surveyor, 13, Barnhill, Stamford	"
M. R. Glynn, M.I.C.E., Borough Engineer, Town Hall, Eastbourne	"
W. H. Weston, J. B. & Co., Surveyors, 10, St. James's Place	"
Finnell and Green, Land Agents, Walsley	"

Rural District Council
Corporation
Corporation
Rural District Council
Guardians
Urban District Council
Watford Rural District Council
Urban District Council
Urban District Council
Glasgow Corporation
Lanark County District Committee
Clayton and Keymer School Board

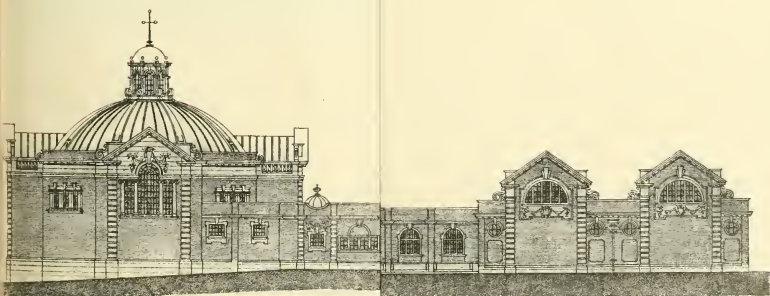
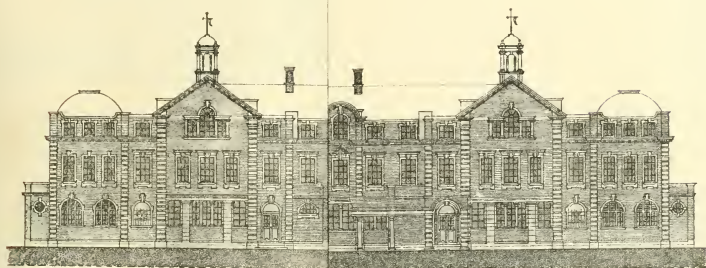
London, E.C.—Steel Rails and Fishplates
 Dudley—Iron Staircases, Landings, Balconies, &c.
 Kilmory—Water-Pipes 800 yards of 8 in., and 540 yards 6 in.
 India Office, S.W.—Rails and Fishplates
 Ilxton—Cast-Iron Water-Mains 4,000 lineal yards
 Itzike—Iron Parade Railings
 Stamford-le-Hope—Cast-Iron Socket-Pipes 60 tons
 Nottingham—Water-Pipes 2,600 tons of 18 in. and 24 in.
 Ilfracombe, N.—Cast-Iron Lamp Columns 100
 London, W.—Steel Bridge Girders 120 tons
 Amsterdam—Tramway Rails 5,000 tons
 Exisle—Galvanised Wrought-Iron Tanks, &c., at Cemetery

Burma Railways Co.
Guardians
Urban District Council
Secretary of State for India
Urban District Council
Hoylake and West Kirby U.D.C.
Orsett Rural District Council
Water Committee
Urban District Council
Great Western Railway Co.
Municipality
Joint Burial Committee

The Company's Architect, 76, Gresham House, Old Broad-street, E.C.	Aug.
Herrbert Crawshaw, Office, 13, Regent-street, Barmsey	"
M. Hosly Clerk, Killmore	"
J. D. Director-General, Suez Canal, India Office, Whitehall, S.W.	"
Wm. Hedley Grieves, Town Surveyor, Town Hall, Buxton	"
T. Fuster, Engineer, D.C. Offices, Hoylelake, Cheshire	"
R. P. Grantham, M.I.C.E., 23, Northumberland-avenue, W.C.	"
E. J. H. Guthrie, Esq., Victoria Station, Birmingham, Nottingham	"
E. J. Lovergrove, Engineer, 89, Southwood-lane, Highgate, N.	"
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ALTERATIONS.

UNDER the name of alteration a great deal is done that would be better left untouched. Great designs and buildings have been tampered with and spoiled by the removal of something that gave them their character, or by additions to a building that was only designed in the first instance to have a definite elevation, or by unsympathetically adding to a façade which was complete in itself. How many buildings have been thus ruined? Few architects cannot remember some particular instance where a building designed with special reference to a site, having proportions and a distinct character of its own, has been completely spoiled by the addition of a new wing or a few bays of windows. What was pleasing and picturesque before, now appears ill-shaped and out of proportion. It is worse to meddle with a building of Classic design, having regular features and balanced parts, than it is to make alterations to old or irregular buildings, though in both cases much may be marred. In the first place, in every design there is a unit of composition that ought to be preserved; by which we mean a salient part of the building, by obliterating which or disregarding it failure results. The unit of a Classic building is often its entire façade, a centre or portico and its wings, by removing or destroying any part of which the design is entirely marred. We can add to each side, bring forward or return backward, a wing, or both, but we cannot alter or modify the composition without destroying it. Thus we cannot well add a second portico, or make one wing longer than the other. The Classic scheme being complete in itself, we cannot repeat it, add to, or alter it without risk of marring the composition. A building in an informal style admits of variation: we can add a gable of different size, or reverse any unit of the composition. Thus we may place two or three gables together, repeat a bay window or a projecting wing, that will only give variety to the whole. Such a picturesque assemblage of gables or features as we see in the Tudor and Renaissance residences of this country, as those of Hampton Court, Haddon Hall, Burghley and Hatfield Houses, afford the architect a free hand in alteration without seriously disturbing the composition. A turret or gable added to these, say, of Burghley, would not destroy the effect of the whole, providing of course it was done with care; but a structure like St. George's Hall, Liverpool, or the Madeleine, Paris, would be spoiled by any addition.

A successful alteration to a building will not only preserve the unit or "key-note" of the composition, but it will be sympathetic with the original design. We could mention several buildings which have been altered and enlarged by architects who have come to their task without careful thought and preparation. How many architects, masters of the Classic school, have inflicted irretrievable mischief in restorations or additions to Gothic churches and mansions! It is almost unnecessary to mention alterations by James Wyatt and many of his contemporaries and successors; and the contrary holds equally good. They have not spared the most beautiful features of our cathedrals: towers, west-ends, Lady-chapels, traceried windows have been ruthlessly altered or destroyed. The old Gothic restorer, perhaps as wanton an iconoclast as the veriest churchwarden of the eighteenth century,

because he did not hesitate to design in a style he neither understood nor sympathised with. He tried to copy the style and features, but he could not; he thought he could imitate a Mediaeval traceried window or a buttress, but he signally failed, because he did not understand the principles. His traceried windows were often of wood, the curves and striking centres were wrong, and the window had a "cardboard" look about it. His buttresses and pinnacles were at fault, and were not based on the true principles of stonemasonry: the weatherings had flat slopes, and were of stone slabs or cement made to project at the sides. We all know what the old Churchwarden Gothic was like of the early years of the last century—happily there is little of it left. The would-be restorer, if he copied, evidently thought he could improve on the details, and the stuccoist tried his best to do so. The result was a dismal failure. Much, of course, was due to the imitation in cement of stonework. We also know that the old timberwork roofs were buried under plaster ceilings. The work was that of the ignorant and unsympathetic restorer—he did his best according to his lights. Afterwards, when church restoration was better understood, we had restorers—men like Pugin and Scott, Ferrey and many of others—well versed in Gothic architecture and detail, who were more sympathetic, but still lacked the right spirit. They sought to preserve unity and harmony in the works they were engaged upon at any cost.

We know what vast sums of money have been spent on the restoration of cathedrals and churches in the careful reproduction, almost stone for stone, of west fronts, naves, towers, transepts, and choirs. We can admire the splendid restorations carried out at Salisbury, Westminster, Winchester, and other great churches under the late Sir Gilbert Scott, Mr. Street, and Mr. Fowler. Knowledge and sympathy were both brought to the task. Much, however, of this work has been misdirected labour, under the idea that preservation necessitated restoration. We cannot look with much interest on the restored west front of Salisbury or St. Alban's, except as mechanical replicas of the old work. The old spirit and method of the Mediaeval builders have dawned upon us: the Middle Age builder was fearless and bold in his alterations and restoration. If a nave required lengthening, or a choir or Lady-chapel enlarged or added, or a tower built, he undertook the work unhampered by any regard as to style. His designs were simply made in the traditional manner of the period in which he worked—he understood and cared for no other; he did not pretend to preserve the unity or harmony of the building, and so it is we have in our great cathedral and monastic churches a mixture of the most diverse styles, from massive Norman to Latest Perpendicular, the massive cylindrical shafts and arches of the Norman close beside the elegant clustered shafts and moulding of the Early English. The builder understood thoroughly what he wanted to do, and did it in the most direct way; he did not pretend to understand a previous style, while he showed his sympathy by leaving it alone, or by imitating its pristine beauty instead of trying to imitate it. We are *par excellence* imitators; but does imitation show true sympathy? It may not. It is better sometimes to be honest and direct in our work, and trying to follow in our own way the methods left us rather than to imitate the results. The truer sympathy is found in adopting the principles of the old builders.

The modern alterer is much in the same position; he ought to thoroughly understand the alterations necessary to be made, but should also do his work in sympathy with the old building—that is to say, he ought to understand thoroughly its structure, and

keep in view, if possible, the intention and "key-note" of the original design. There is one direction in which an alteration is likely to mar the work, and to which we particularly call attention here. We mean in works of a decorative character. The present craze for enlargement and decoration of shops, restaurants, and hotels illustrates in a forcible manner the want of attention to first principles of design. The proprietor of a large shop or restaurant, in obedience to popular taste and a desire for so-called "improvement," and to bring his premises up to date, proposes to do something in the way of decoration. He covers the interior of his vestibule shop with glazed faience decoration, as far as he can, the fittings and walls behind them remaining as before; but this decoration has the undesirable effect of rendering the plain coloured walls and whitewashed ceiling plainer and less bearable than before. The coloured and panelled faience is out of "key" with the plainer part of the interior. Decorations of this kind are very well when they form a part of a general scheme of colour, but when applied in part to old premises become positively absurd and almost offensive. Or an owner of a large Victorian restaurant is seized with the idea of putting up an ornamental ceiling to a shop that is quite plain. There are wood fittings against the walls which are also plain; there are no pilasters which call for corresponding ceiling beams, and one side of the shop has a mahogany glazed screen. An elaborate design for a plaster relief ceiling is approved and fixed. It is divided into panels of a bold and handsome design by moulded beams; but they do not align with anything. What is the result of this ceiling but to completely destroy the "key-note" of the shop? The large panelled pattern of ornament in relief apparently reduces the height and width of the space, and the whole interior is thrown out of harmony. Alterations of this kind demand the exercise of the nicest skill in decoration. We have seen many interiors and rooms spoiled by the adoption of an elaborate ceiling decoration that is not suited; perhaps a bold design in high relief on walls that have no pretensions without division into bays by pilasters, where a small simple pattern of low relief would have been more in unison. The effect of a large and deep relief pattern is, of course, to reduce the height and size of the room, and the decoration, instead of enhancing, has just the contrary effect. The visitor is disappointed at the result, though he may not know exactly the reason. For indefinite spaces and rooms, less marked and simple ornamentation is desirable, and the low relief and smaller patterns are more suited. To avoid any disappointment, the plan of fixing temporarily the pattern or relief is necessary, by which means the scale can be determined. In decorations generally the importance of scale cannot be too strongly urged. The division of a wall or room into bays by pilasters is one means of obtaining scale, and the ceiling division ought to correspond. The size of pattern is of course one of the best ways of securing a proper relation. Architects do not always consider this point in the design of their decoration, such as the repeats in a pattern in plaster or wall-paper. We constantly see egregious mistakes made. In public hall ceilings of arched shape we often see large and coarse ribs springing from huge cornices, the effect of which very considerably reduces the apparent size of the hall. This is a common error in many of our new vestry-halls, when economical considerations have prevailed. But our remarks chiefly apply to the alteration of buildings, when a scheme of decoration is proposed for an existing room. The key-note and scale of the room must be considered in the proposed plan—points which ought to receive the best attention.

STREET REMODELLING AND BUILDING.

JUST now the belated Londoner is small subsiding with denudation of old houses, and the noise and dust of the housebreakers. He can go nowhere through any of our chief thoroughfares without seeing huge gaping areas of cleared sites or masses of debris. It is rather disturbing to him, for he probably finds his favourite restaurant or chop-house pulled down and its proprietors gone to menduce his countrymen, neighbourhood, and he has to seek other pastures. Well-known landmarks are removed, as in the progressing demolition of Holywell-street, which students, book-worms, and comic hunters all over the country will regret as of some old level hand. These disturbances which it will take some time to get over, although the reconstructed areas may guarantee us large open areas for recreation, new buildings that give us delight in their proportions and architecture, trees and grass paving, the old order of things and their associations and memories, retain a pleasant hold on the imagination that are difficult to shake off. Can we say our public so-called improvements have given us complete satisfaction? Do Charing Cross-road and Shaftesbury-avenue realise the aims of their promoters? They are useful routes from important centres of traffic; but we can scarcely say they equal the expectations that men formed.

To pull down and rebuild does not always imply improvement. Removing an old historic building or landmark because it stands in the way, or projects from the prescribed line of a street, is not improving; at the same time we do not put in its place a handsome building, or substantially all to the pleasure or convenience of the public. To demolish an interesting house or row of houses and rebuild in their place a row of modern shops a little further back, can give very little satisfaction, except to those immediately interested in the property. To attract the foreigner and the country visitor more is required than a number of wide streets with showy elevations. There must be something to draw the visitor, to interest him, to take him out of the bustle, dust, and heat of the crowded thoroughfare, such as an interesting court or inn, an enclosed garden like that of the Temple, an ancient church, or a public building. These are features that make Paris, Vienna, Berlin, and other Continental cities interesting to visitors and strangers, as well as many of our own provincial cities. They have made old London what it is, attracted people from the United States and other countries to the Metropolis, to wonder over the treasures and relics of a great city rich in historic traditions and associations, enriched by memories of places, houses, and streets, and by men like Shakespeare, Pope, Johnson, and Dickens, whose writings have given them a world-wide celebrity. To ruthlessly destroy all these things for the sake of making wide and sanitary streets is what we ought to guard against. The pressure of population is no doubt a strong incentive to the removal of large historic buildings in the City and suburbs, and the rebuilding of narrow streets and lanes with their unsanitary dwellings; but we may do this in such a manner as to sicken people with modern conditions of town life, to take away from them all the opportunities which are given by tradition and imagination, to eat down everything to the letter of a sanitary or a building Act. Fortunately we have a few attractive features left. There are those delightful oases of refreshment in the weary waste of our streets, the Temple Gardens, the Embankment Gardens, and retreats like New Inn, Gray's Inn, Staple's Inn, to say nothing of Lincoln's Inn Fields, and our large squares

and parks. We look anxiously forward to the great scheme known as the Strand-to-Holborn Improvement. A new avenue might be purchased so dearly if we have to destroy one great or historic building for the sake of making a straight road of shops and offices. Nearly every part of the Metropolis has suffered from the removal of some old landmark—rows of old houses that gave an interest to the locality; irregular and quaint frontages. We can name the transformation of the older streets, such as Church-street, Colldarbury-lane, Lamb-berly; the destruction of old houses of great interest at Putney; the reconstruction of parts at Fulham, and notably Bromley-by-Low. We cannot deny that many of the old houses were in a dilapidated and insanitary state, and their rebuilding has been attended with an improvement both to the health of the district and rental value of the property. Against these advantages we have to set the demolition of interesting houses of a certain rural charm and picturesque, of new blocks of dwellings shutting out quite fifty per cent. of light and air, and unimproving in elevation. These disadvantages are suffered not so much by the inmates, but the whole neighbourhood. The modern street improver ignores them; he looks only at the improved rentals and the better rooms.

To take a glance at what is going on in the area between Drury-lane and Wellington-street, we observe a clearance made of a very considerable area in the very heart of London for the Holborn-to-Strand scheme. The demolition has disclosed many interiors of old and dilapidated houses, not a few with timber framing; we notice examples in Drury-lane. In these are to be seen remains of interesting, framed and moulded work. It would be interesting to know the age of some of these old dwellings; they appear to be 17th-century work, but their very dilapidated and squalid condition and the dirty state of the premises make the demolition absolutely necessary in the interest of health. Of course the area so cleared will shortly show signs of reconstruction. Already there are indications. Soon the mask of a large recently-built hostility in the Strand will be removed, and reveal, set back a few feet, half-timbered and of a noted winehouse, in a revived 17th-century style, with small-paned and thick-barred windows; the high curbed and dormer roof already appears above the old facade. It is apparently a temporary erection. But for the expense, it would be a reasonable way of judging of the effect of a scheme to erect full-size models of any of the designs submitted in the late competition that might be thought worthy of such an experiment. When we look at the large area involved, and what might be the result of individual and commercial influence, we are almost afraid to think of the result. The examples of recent so-named improvements do not make us feel very confident of results. Between official red-tapeism and individual and commercial interest, all the ideal merit of an architectural design is suppressed.

Looking at the actual work that has been accomplished of late in the way of widening the Strand, are we quite satisfied? A wide, thoroughfare has already been thrown into the thoroughfare between St. Mary's Church and the Law Courts, and shortly the whole of the area occupied by the old premises forming the shops and Holywell-street will be added to it on the north side. A very spacious area of roadway and footways will be thrown open, and two magnificent lines of frontage be created for buildings that ought to be worthy of the situation. One or two points deserve notice.

In connection with the widening of the Strand at its junction with the new street improvement, the Council has been re-shaping the old lines of curbing and footways round the two churches of St. Mary-le-

Strand and St. Clement Danes. From both churchyards a considerable area has been abstracted by setting back the walls of inclosure and the iron railings nearer the churches. We cannot say the result has been an improvement. The approach from the ornamental stone pier of the gateway entrance to St. Mary's has been curtailed by several yards, and on the south side of the church the iron fence has been set inwards to give a wider footway. By this reduction the yard in front, once adorned by several trees, has been so narrowed up as to make the entrance to the circular portico of the church a mere passage narrowed to the width of the gateway at the west end. We cannot see any advantage by this reduction; it does not affect the Strand on the south side, which remains the same width as before, except for the few feet extra of paving next the church. On the narrow north side nothing has been gained. On the other hand, the dignity of the approach to the edifice, one of the most attractive of churches outside the City, has been sacrificed by cutting off a considerable part of the length. These "island" churches in the midst of a great thoroughfare ought at least to have a difficulty. The result is to clean the noise and vibration of traffic, and make an approach worthy of their use. To rob them without in any way improving the approaches is almost a wanton spoliation. In the case of St. Clement Danes, the churchyard has been curtailed considerably on both sides, the space being thrown into the roadways on each side. We do not complain of the north side, where the road has been widened to allow the up-railings a good width between the Law Courts gardens and the church, but the curtailment on the south side is a serious loss. It is thrown into the pavement between Essex-street and Milford-lane, thus widening it considerably. By this means the roadway has been brought more in line with the Strand, reducing the curved detour round the church on this side; but the chief objection to the lines as now completed is that the churchyard on the south side has been reduced to a few feet round the eastern apse, and the pavement on this side next the railing has not been widened sufficiently, only just wide enough for two people to pass. This is hardly enough for a mistake. The pavement on the church side ought at least to have been made wider while the alteration was about, and the roadway curb on the south side of Strand just eased in its curve to give a few feet more of paving. The paved footway on the south side of church has been rendered almost impassable by large gas standards which occupy quite a foot of the pavement, not allowing an open umbrella to pass between the high railings of churchyard and the lamp-post. Such a result is to be avoided such as this by making the dimensions between these two points wide enough to clear an ordinary umbrella. It is a little detail, but just such a one that careful planning should have rendered impossible. Common-sense would appear to suggest an equalisation of the footways. Round an isolated building we should have looked for a footway of sufficient width to give base and importance to the building; certainly round a church the extra width would have been a consideration. We should have seen the vehicular traffic away as far as possible, rather than a narrow pavement of 3 ft. to 4 ft.

Street-widening has now become an absolute necessity in the congested parts of the City. The setting-back of premises at the east end of Fleet-street has been a great boon to traffic; the same widening has been resorted to near the site of Temple Bar and St. Clement's Church; and it is now proposed to widen the western end of Piccadilly, by the Office Works, by setting back the railings of Grosvenor Park, and to throw into the thoroughfare a strip of the park about half a mile in length, and varying in width from 32 ft. at

the eastern end to about 70ft. at Hyde Park Corner. When we have to rob our parks for the purpose of widening a road in the least busy part, with houses on one side only, and with no cross-traffic, as Mr. Basil Holmes has pointed out, it is quite time to protest. At Hyde Park Corner there is almost more space than necessary, and crossing at this point is rather dangerous for elderly people. Indeed, when we widen a road at one point, it becomes more dangerous, and tends to create a congested part at another point of the route. As Mr. Philip Burne-Jones in a letter to the *Times* observes, the "neck of a bottle will only allow a certain amount of water to pass through it, no matter how large the bottle may be, and the widening of the roadway parallel to the Green Park will never solve the question of congested traffic so long as the neck of the road from Walsingham House to Piccadilly-circus remains as narrow as it now is"; and he proposes a subway instead. The illustration, however, if true, is happy, and illustrates the absurdity of widening a thoroughfare in one part before the whole length of it can be widened—an improbable thing in our generation. As another writer says, the only effect of widening Piccadilly will be that the omnibuses will be in larger groups, and the congestion will be the same, or rather increased. If the police could regulate the traffic by causing the omnibuses to follow in line in one direction, not occupy a large portion of the roadway in echelon fashion, the mischief would be lessened.

Three important public buildings are in progress—the two Government blocks of offices in Whitehall and Parliament-street. Singularly, the architects of both have died since the designs were accepted, and the late Mr. J. M. Brydon's designs and detail of the Government Offices in Parliament-street are to be completed by the Office of Works; also the large extension of South Kensington Museum that is about to commence at the corner of Cromwell and Exhibition roads, the site of which has been cleared of the temporary and unsightly erections that have so long encumbered this fine position. We have published the designs of all these buildings, and we can look forward with some degree of hopefulness. They will mark an epoch in the architectural history of the century, whatever their merits may be. We must place them among the isolated attempts we have made in the way of architecture during the last fifty years. A grand opportunity, for an architectural *coup de maître* was lost when three distinct architects were commissioned to erect the buildings within the site of the old Horticultural grounds. Now we have three competing edifices of monumental character: the Natural History Museum, the Imperial Institute, and between them the proposed Royal College of Sciences and Museum, to say nothing of the Albert Hall and the City of London Guilds Institute, buildings crowded together in an area not too large for one of them, and without any unity of conception between them. We now look on them as examples of three of our leading architects—specimens of individual taste. One conception if realised in the right spirit will distinguish the opening years of the new century, and may do something to make amends for our lack of public enterprise in the monumental works. We mean the Queen Victoria Memorial, the provisional design for which has been accepted. Mr. Aston Webb's scheme, with the sculptural embellishments of Mr. Brock, a general description of which we gave, if carried out, will form an imposing processional approach to Buckingham Palace. The widened Mall, with its triple roadway or garden and processional path, will connect the Palace with the Horse Guards, and in its route the entrances of St. James's Palace, Marlborough House, and Waterloo-place will form part of one great united scheme, while

at the Palace end the great vista of arcades will terminate in a large semicircular place or garden, emphasised by a noble group of sculpture as a personal memorial of the late Queen. But the architectural treatment of the Mall is not definitely settled upon, and is not included in the immediate purpose of the committee; for the present the semicircular court garden facing the Palace, and its inclosing screens or colonnades, with the great memorial of sculpture is probably all that will be accomplished. As usual, the architect has to give first place to the sculptor, and what ought to be a great scheme with architectural surroundings worthy of the site may be left after all in a fragmentary state.

Of actual street architecture we can show very little. One huge facade, that of the Hotel Cecil, has been completed in the Strand, rather flat in treatment and relieved mainly by the bright red brickwork between the stone pilasters and window dressings. We can hardly speak of it as a work of dignified architecture, and the detail of the centre pavilion is open to criticism, but we must take it as an important contribution to our Strand architecture. The site demanded something more diversified in its facade, and greater relief between the centre and wings. A large and imposing facade is that of the Birkbeck Bank in Holborn; the upper stories, entirely built of stone-coloured terracotta, with a basement and mezzanine of a polished dark grey granite. The central entrance is a dignified archway supported on coupled groups of columns of the same material. The arched portions on each side are let as shops. The superstructure is entirely of terracotta, the main features being a centre of slight projection, which breaks the cornice line and flat bays at the sides, corbelled out in the dark granite of the entresol. The fenestration is richly modelled with window mullions and transoms carried up as vertical lines of bays, the whole designed in a kind of French Renaissance. The roof lines are broken by ornamental corner pavilions. A more remarkable elevation—an experiment in coloured and glazed terracotta—occupies the area between Southampton-buildings and Staple's Inn on the east. The front and return wings are faced with brown terracotta in two shades, relieved by coupled columns and ornamental features in a light blue-grey. This part of Birkbeck Bank Chambers is an extensive block of offices. The main entrance between the two principal facades in Southampton Buildings forms a capped corner, and rises to a considerable height as a tower crowned by a pyramidal roof, and enriched by decorative features all modelled in terracotta. A very elaborate and rich effect is produced by this corner tower, which forms a very ornamental object seen from Chancery-lane. The arches between the window bays are adorned by panels and bands in darker terracotta, and a series of oval medallions of celebrated men are modelled in bas-relief. The side towards Staple's Inn is being extended. Opposite are the new offices of the Patent Office—an extensive front rather flatly treated, of white brick and stone, in a kind of Elizabethan style, with large, flat-mullioned windows. The close proximity of these ornate buildings to the quiet corner of Staple's Inn forms an almost strange, if not grotesque, combination of the old and the new. The towering height of the chambers on the south side, compared with the low, old brick houses and the Hall of the Inn looks aggressive. These buildings exhibit an advance in the use and treatment of terracotta; the lines of the mouldings are true and well kept, the relief is moderate and the colour uniform. No better example of a cream-toned facade of this material can be seen than the facade of the Birkbeck Bank in Holborn. Across the road the extensive additions to the Prudential

Offices, now being made, is a further example of excellent terracotta building in a deep red colour which matches the building at the corner. The elevation is of considerable length, and some variety has been obtained by slight projections and by gables, the style chosen being Gothic of a type that lends itself to moulded work. The large bay windows, with geometric tracery, will be the principal features in the facade. These conspicuous experiments in terracotta afford evidence of a desire to avoid the blackening effects of the London atmosphere on stone and brick. In Fleet-street and Ludgate Hill, additions to the street architecture have been made in red brick that show a desire to get away from the stereotyped and over-wrought designs of the modern Renaissance school. Elaborateness and superficial ornament—a sort of veneer of architectural detail in stone or terracotta, is the predominant note in our streets; but it has had its day, and a stronger and more vigorous adaptation of vernacular brickwork is superseding it. More honest construction will be the result of a disuse of the stone-casing and veneer style. Our piecemeal and fragmentary improvements are inimical to any scheme of civic architecture. Everywhere individual aggressiveness is apparent in our building, the desire to compete in some form of exaggeration of style. Strange and grotesque versions of Gothic or Baroque are seen in Holborn and other thoroughfares, extremely clever, quaint, or eccentric, but they are not healthful manifestations. When the spirit of collectivism and co-operation prevails, when lessons of extended sites in our streets combine together, we may hope for larger and more united schemes worthy of the best traditions of a national art.

RISKY FOUNDATIONS.

ALMOST periodically reports are current about the safety of our public buildings. A few years ago attention was called to the rapid decay of the stone of Westminster Abbey, and the serious consequences that were likely to follow. Within the last week or two an alarm has been raised that cracks in the walls and arches have appeared, and suggestions that the subways proposed to be made near St. Paul's Cathedral would imperil the edifice. We have now more direct evidence of danger in the facts published by Mr. Somers Clarke, The President of the Royal Institute of British Architects referred to the vibration that would follow the working of the City and Piccadilly Railway, and he expressed the opinion that there would be real danger were this Bill passed. Mr. Somers Clarke, in a long contribution to the *Times*, has disposed of some of the ill-founded ideas that have been broached. He has shown what is evident to everyone—that the weight resting on the eight piers which carry the dome and on the abutments below has caused the foundations to become more consolidated, which have therefore sunk a little more than less heavily loaded parts. We refer the reader to the statement we publish. Vibration set up by a railway in a tube might become injurious to a building that was near to it, especially if the strata of ground on which St. Paul's reposes is in any way susceptible of shock or vibration. The reports state that it is on the south side of the Cathedral that the structural defects have been discovered, particularly in the arches of the transept; and it is pointed out that the constant disturbance of the ground on this side for mains, subways, and large building sub-basements has affected the subsoil on which the foundations of the Cathedral rest. There is no doubt sufficient ground for the action taken by the Dean and Chapter in opposing the proposed tube, which would pass near the south side of the structure. Anything that would cause the sub-

soil to be disturbed, or that would deprive it of its compactness by drainage of water, may be injurious, and it may be quite true that the large warehouses on the south side with deep basements have somewhat impaired the continuity and compactness of the soil. No doubt engineering and geological experts that may have been consulted have satisfied themselves as to the real condition of this particular case. If we consider a heavy structure of masonry resting on a level subsoil that is of uniform thickness and of a compact nature like rock, gravel, or hard clay, and is incompressible or equally yielding, the danger due to vibration would be small. If, on the other hand, we imagine the subsoil to be not of uniform thickness, and yielding unequally to pressure, the bed of which slopes, or is not level, such as many kinds of compressible clays and marshy soils, the effect of a tube railway or any deep excavation near a heavy structure would be attended with some risk to it by removing any lateral support that before existed. A third condition may be noticed in the case of sites made of soils that, though incompressible, require to be laterally confined to prevent them from spreading, such as loose gravel and sand. This kind of foundation is the most unstable and uncertain if the lateral support is reduced or cut away by excavation, though, if well confined from lateral flow, it is quite as good as any other. Compressible soils, of course, are worse, and require the greatest care to prevent lateral escape; but the most uncertain and treacherous of all foundations is one made up of different kinds of soil—some more compressible than another, in which case the greatest care has to be exercised to avoid settlement and cracks. Several plans are resorted to in order to insure an incompressibility of the soil where, from any of those causes, it is apt to shift or escape. We can surround the foundations by short piles, to prevent lateral flow, or wide trenches may be filled with good concrete, to distribute the weight of structure over a large area; or the trenches may be filled with moist sand carefully rammed, the sand pressure being resisted by the surrounding soil; or a number of sand piles may be sunk over the site, which will serve to consolidate the soil, and make it more incompressible. These sand piles transmit the pressure or weight equally, and the shock of the pile-driver is avoided.

In semi-fluid soils mounds or platforms may be used to distribute the weight of building over a large area, and the fascine platforms have been used consisting of several courses of brushwood. In the foundations of high American buildings grillage is used where the semi-fluid soil extends to a great depth, or soft soil overlies a solid substratum. Piles are driven at uniform distances over the area, and a grillage is constructed on the top of them. The grillage may be of timber or of steel rails. In London we have to meet the condition of undrained clay. Foundations like those of St. Paul's rest on a substratum of clay, and if this is not drained great caution is necessary, that excavations or borings for tunnels or the like made in the immediate vicinity of the building do not permit the clay under pressure to escape from under the building, and when, as we have said, the strata is not horizontal but has a dip, extra caution is required to prevent the flow of the soil. It is, we believe, a fact that the foundations of St. Paul's Cathedral rest on a depth of dry solid material which when caused to be prepared, in which much of the debris of the old edifice has been used. In its construction this artificial platform rests on a substratum of mixed sand, and it is mainly the condition of this that has to be insured. If any deep boring for a tube is made in this substratum, the danger to be apprehended would be mainly in the direction of drawing off the water that is in the lower clay, and rendering it liable

to move or crack. This could be prevented to some extent by a deep and wide wall of concrete on the south side, that could be filled up piece by piece. If the strata incline towards the south, or the drainage is in this direction, as is most likely, such method of retention and preventing the escape or oozing away from below the building would appear to be the most efficient method of prevention. Of course, a weighty vaulted structure like St. Paul's, in which the walls act more or less like buttresses to resist the thrust of the vault of nave and transepts, added to the great weight transmitted through the drum of dome to the arches of the crossing, is more likely to yield unequally than a building in which only a static weight had to be supported, for any slight escape of soil below the outer footings of the walls or piers would enable the thrust at the upper part to exercise a leverage of the height to the springing of the concealed flying buttresses. Of course, if a solid and compacted platform of concrete had been made under the whole structure of some depth, there would be less risk of subsidence, supposing such a platform had been brought up from the hard dry clay. Another hypothesis to account for the cracks discovered is that in the course of time the drainage of the clay substratum under St. Paul's has become more perfect owing to various causes, the better drainage of this part of the city, to excavations, and as the clay dries and becomes harder it shrinks in volume. This would account for the vertical settlements under the dome and western towers referred to. As to vibration, we are hardly in a position to say whether it would be sufficient to cause danger, though the damage done by other tube tunnels by causing a tremor in the ground cannot be contradicted. In all probability great damage to properties has been due to disturbance caused by excavation, drainage of the soil, or its lateral escape under pressure; but these are, of course, only conjectures. Experimental borings and other investigations are the only practical measures that can be resorted to discover the actual risks, if any exist. Well-conducted experiments on soils loaded with heavy weights or buildings are desirable to establish facts that might be of service. In the mean time, Mr. Somers (Clarke's) warning should receive the attention it deserves.

KENT ARCHEOLOGICAL SOCIETY.

A VERY interesting meeting of the Kent Archaeological Society was held at Maidstone last week. Lord Stanhope presided at the opening gathering on Tuesday, at the conclusion of which a visit was paid to

THE OLD PALACE.

under the guidance of Mr. Hubert Bensted, who read a brief paper on the history and architecture of the place. In a manner, he said, the palace in its very early times belonged to the See of Canterbury, and appeared in Doomsday Book among those held under the Archbishop. It must, however, have been alienated, for according to Philipott it belonged in 1207 to William de Cantilupe, or Cantilupe, who presented it, together with the castle, which lay on the south of the church, to Stephen Langton for himself and his successors. John Ifford began to build the palace in 1348, but died next year; Bradwardine, his successor, scarcely survived consecration. Simon Lelip, who followed him, and carried out and completed Ifford's design, using it as a basis, largely the material from a house which he pulled down at Wrotham. Courtenay, who made certain additions, died there in 1396. Morton had always been credited with having made substantial additions, but it is now clear, from recent discoveries, would seem rather to point to the fact that Warham, as the builder, for on less than three fireplaces, and those belonging to rooms of considerable dimensions, had the arms of that Primate been discovered. Both manor and castle continued the property of the Archbishop until Crammer, by command of Henry VIII., in twenty-ninth year, granted them,

together with almsowson and patronage of Church and College, in exchange for other revenues. Henry very soon after gave them to his friend, Sir Thomas Wyatt, the friend of Allington, whose son, Sir Thomas Wyatt, owing to the part he took in the rebellion, confiscated them to the Crown. The Palace, together with other premises in the town, was granted by Elizabeth to Sir John Astley, one of whose descendants sold it to Richard Wray, the first Earl of Aylesford. Baron Astley was a famous General of Charles I. It is now the property of the town, having in 1887 been purchased by subscription as a memorial of the jubilee of her late Majesty, Queen Victoria. The Astleys built the east front, having first taken the tower, the first Earl of Aylesford's remains of the east wall of which still exist. Mr. Bensted, in conducting the members over the Palace and buildings connected with it, drew particular attention to the remains of early Norman masonry in the southern garden.

All Saints Church having been inspected, attention was called to its dimensions, which are remarkable, it probably setting upon the floor level more persons than any other parish church in the county. Yet it is not nearly as large as it has been represented. The actual length of the church inside is 166ft., the nave is 100ft. long, the chancel nearly 50ft., and the space between the two rather 30ft. Cranbrook Church is longer, so also is Lydd Church, while at Faversham and Minster-in-Thames the churches are not 60ft. shorter. But the great width of the church is its peculiar characteristic. The nave of Rochester Cathedral could almost be put inside this church. Its great width enabled the nave with its aisles to contain sittings for 1,400 people, the chancel can seat 200 more, and it is said that 2,080 persons were once accommodated. In the way of accommodation Faversham probably approaches Maidstone most nearly. Faversham is 1,400 people, and its area is 11,060sq.ft.

LEEDS CASTLE.

By carriage to Leeds Castle was the first order after luncheon. The famous pile was described by Mr. W. A. Wood, of the S. S. Museum. The Castle stood, he said, upon three rocky knolls, of which two were islands in a lake of about 15 acres in extent, and the third occupied the central part of the artificial bank by which the waters were retained. The island on which the castle stood was the site of an earlier stronghold, tradition stating that such a place existed as early as A.D. 857. This was, perhaps, a Saxon house of timber; but the oldest work now seen dated from Edward I., the chapel, judging by its style, belonging to the reign of Edward III. The castle probably took the Saxons for as they found them, and the Norman Shell-keep was constructed by changing the Saxon buildings of wood into fabrics of stone. In the reigns of King John or Henry III. a doorway in the gatehouse, the barbican and its wings, and the inner wall of the bailey were, it is thought, designed, being portions of a definite plan which, once adopted, was deliberately carried out until finished. The lower portion of the old Castle and the chapel were assigned to the period of Edward I., and the barbican over the gateway was built during Richard III.'s reign. Relating an earlier one inserted by Edward I. and repaired later by Edward II. Extensive alterations apparently did not take place until the period of Henry VIII., when the upper story of the old Castle was formed. At this time, too, the Maidens' Tower was built. While in the possession of the Smith family of the Strangford ancestry, an Elizabethan mansion was erected in the 17th century at the north end of the large island. In 1822 the present mansion was erected, during which many remains of the earlier structures were recovered. While relating an earlier one remarked in the course of his paper, was a water tower with a very remarkable bath constructed for the use of Edward I. in 1291-2. It communicated with the lake by means of a passage in which were still to be seen the grooves of the portcullis. The upper story of the tower has been excluded or retained by means of an ingenious arrangement of slabs or sluces, which allowed of the cleaning of the bath without letting off the water of the moat.

Visits were subsequently paid to Leeds Church and Battle Hall, Leeds, and the annual dinner was held in the evening at the Town Hall. Lord Stanhope in the chair, after which the Mayor and

Mayores gave a reception in the Museum and Art Gallery. An interesting paper on the Houses of Old Maidstone was read by Mr. Hubert R. R. R. R.

On Wednesday, Bexley Abbey, Sutton Castle, East Sutton Place and Church, and Uleomb Church were visited, the proceedings terminating at Uleomb.

SOMERSET ARCHEOLOGICAL SOCIETY.

WE gave last week a brief report of the first day's proceedings of this Society in connection with its summer meeting at Bristol.

On Wednesday week the members made a tour in brakes through the northern portion of the county. Leaving the Royal Hotel, Bristol, in the morning, the vehicles proceeded to Whitchurch, and having entered the church, Mr. E. Buckle, the diocesan architect, gave some particulars of the structure. He said the building was a very good one from which to start their expedition, as they had a very characteristic example of the early Somerset style which started from Wells and Glastonbury, and which they found fragments of in Somerset, and especially in the Walsley and Ireland. He referred to the curious shafts to be seen in the church, and remarked that similar shafts might be seen in Witham and Shepton Mallet. Lieutenant-Colonel Bramble made some remarks on the stained glass, and he said they had there very dark glass over the pulpit, and some of the glass was of the incumbent to read his sermon. He supposed the congregation wanted him to preach from memory; but this showed that when coloured glass was put in it should be done by an architect. The party thanked the Rev. E. J. Franklin, the vicar, who had welcomed them, and then, re-entering their vehicles, they proceeded to Drow. On their way between Whitchurch and Pensford, Professor Lloyd Morgan pointed out the course of the Wansdyke from Maes Knoll, the most westerly termination. He said it might be traced to Savenake Forest. Principally it was a boundary line, but he could not speak with confidence on that point. General Sir Rivers had proved that parts of the Wansdyke were more developed in the uplands than in the valleys, which was a curious fact.

Considerable interest was manifested in the Megalithic remains at Stanton Drew, and the Rev. H. T. Perfect, vicar of the parish, who accompanied the party, was able to afford some information. Professor Lloyd Morgan made some remarks on the stones. He indicated to his hearers where they were standing on the edge of the great circle, and said as they stood there they could trace in the large stones the ring, which was of very considerable size. They could see that some of the stones were of great size, many of them had fallen, and some completely buried since they fell, and were covered with turf. Most of the stones were apparently brought from West Hartpre, about 4½ miles away. The north-east circle was considerably less than the great circle, but the stones there were larger. Some distance from the field in which the greater number of stones are found, the party proceeded to what is supposed to have been a dolmen, in an inclosure near the church. There are two upright stones, and one stone lying across on the ground. Professor Lloyd Morgan remarked that the two large stones might have been placed in position, but it was difficult to know how they were raised. He was sorry that in the whole question of Stanton Drew there was so much conjecture. One or two points he had endeavoured to make out as to the origin of the stones, but there was much beyond the facts that he could not understand.

The party entered the church, and the Rev. H. T. Perfect gave some particulars of the edifice. He said that the structure had gone through great changes, and but little of the earlier buildings remained. The upper part of the tower as far as the bells was taken down in 1847, and not rebuilt to its former height. The lowest part of the tower belonged to the 13th or 14th century. The interior of the church, too, had been much altered since the 14th century. In the wall they saw the old spiral staircase which led to the roof in front of the old chancel. When the plaster was removed in 1889 traces of a text in old English black-letter were to be seen over the upper doorway of the staircase, and remnants of, coloured scrollwork above, running along under the wall-plate. In 1847 the central arcade was removed about 3ft. to the north, making what was

then the narrower now the wider of the two aisles. The bosses on the roof, Carolinian or Jacobean, were worthy of notice. In the north wall of the old chancel were apparent signs of a 13th-century building. It was not known when the old chancel was surrendered and the new one built. In 1889, the interior of the church was entirely rearranged, excepting structurally, and decently furnished. Mr. Buckle, who was invited to make some observations on the church, spoke of the Decorated Period as exemplified in the building. He said that architecture of this style was rare in Somersetshire, many of the churches in the county being Perpendicular. They would, however, on the next day see a great deal of Decorated work. The name "Decorated" was unfortunately a misnomer, as the work was of the plainest description, though they had some rich examples in that style.

The visitors before they left the village were pointed out an old dwelling known as the Bishop's House, because it is stated that episcopal courts were once held therein. Early in the 18th century either that or the church farm appeared to have been occupied as a nunnery. The party were thanked for their courtesy, and the excursionists next made their way to Chew Magna.

The spacious church at Chew Magna was described by Mr. Buckle. He said the building at the start must have had rather a wide nave and chancel, with aisles. In the chancel at the east end they would notice two small windows, one above the other, indicating that the chapel was a two-story building. Outside a doorway had been fitted up, the door having been obviously at the upper floor. They might have noticed in driving round the church what a long circuit they made, apparently to drive round the church, and the distance between the church and house had belonged to the Bishop of Bath and Wells, and they were told there was a bridge or gallery connecting his house with the church, and in the church was a private pew, approached outside by the gallery. It was quite possible a "square" might have been contrived at the upper floor in order to enable the bishop to have view of the altar. When the society visited Thornbury in 1887, they found the same thing occurred there. The Duke of Buckingham had a house adjoining the church on one side, and he had a gallery which connected the house with the upper part of a chapel by the side of the chancel, and the upper floor of the chapel was a similar gallery occurred at St. George's, Windsor, where the Royal pew was on an upper floor overlooking the altar. The screen in the Chew Magna Church, which ran across from side to side, was not at all in its original state. It was a mean object in modern times, so that there was nothing archaeologically interesting in the body of the structure except that two aisles were entirely different in character. One was very florid, whereas the other was excessively plain. The fact was when the church was rebuilt the then clerk desired one part as it had been before, and the other part to be built in the Decorated style. The great point of interest was the lovely tower and spire.

At Chew Stoke the church was inspected, and Mr. Buckle delivered an address on the exterior. He said that the church had been built entirely in modern times, so that there was nothing archaeologically interesting in the body of the structure except that two aisles were entirely different in character. One was very florid, whereas the other was excessively plain. The fact was when the church was rebuilt the then clerk desired one part as it had been before, and the other part to be built in the Decorated style. The great point of interest was the lovely tower and spire.

Leaving Chew Stoke, the party adjourned at their device "Excelsior," and proceeded to Dundry. Professor Lloyd Morgan made some observations on the geological features of the district. He said that much of the stone in the churches had been obtained from the Dundry quarries. They saw the stone in the construction of the new part of Bristol Cathedral, and in the new part of the arch near the cathedral. Mr. Buckle furnished particulars of the use of the Dundry stone, and how it was employed in buildings in Dublin. Continuing their visits on Thursday week, the members left Bristol for Brislington, where, in the absence of the vicar, the Rev. G. P. Whately stated that the church dedicated to St. Luke was usually supposed to have been built in the 14th century, and might have been founded in connection with Keynsham Abbey, by one of the De La Warre family, who were lordship lords of Brislington from the 11th to the 16th century, when the manor passed to the Lacy's. The church, which is built in the Perpendicular style, consisted originally of a chancel and south

transept certainly a chapel, a south porch, and a fine embattled tower 90ft. high, and a nave with a south and middle aisle. The chapel, which was built in the south transept, and the only remains of which is a piscina, is supposed to have been built for the De La Warre family, and a slab now resting upon some *altaris* near the south entrance gate of the churchyard is said to have been an old altar. Mr. Buckle, however, is of opinion that this slab is the top of a monumental tomb upon which a figure, probably representing one of the De La Warre family, formerly rested.

A drive to Bitton was next taken, and when the party had entered the church, Mr. Buckle said there was no doubt the church dated back to a very early period indeed. They would see certain fragments left of work which was quite certainly before Norman times, and the question really about it was largely whether they were to call the original building a Roman or Saxon building. The chancel arch was where most of the old work remained. What they saw most prominent in the chancel was a modern Norman arch, and that arch was put in for the substitution of a classical arch. The Roman remains of a most remarkable arch hidden by that classical work. At the early period of the church there was a very lofty nave, and Keynsham Church had a nave of the same dimensions as that, which made him think that the two churches must have had some connection; either they are erected about the same time, or one must have been deliberately copied from the other. As to the modern work, Canon Ellacombe was his own architect, and he put in the roof and the seats, the carving being done by a local carpenter. As to the corbels which supported the roof, they were fashioned by a carpenter who came from a neighbouring village. The canon had specimens of plants mentioned in the Bible carved under his personal direction, with the result that they were wonderfully natural in appearance.

Keynsham was the next village visited, and there were many features of interest in the church—monuments to the Bridges family, Perpendicular and Jacobean screens, and double piscina. In his address, Mr. Buckle said the nave of the church was practically a repetition of the nave at Bitton. It was 26ft. wide and about 100ft. long. If, however, they supposed that church was started at the same time as Bitton, it was so altered that it was difficult to tell. He showed how churches could be developed according to different ideas. The chancel at Keynsham was Early English. The first addition to the church appeared to have been the south aisle, another example of the plainest possible Decorated work. The other aisle was added later. Probably when the north aisle was added the south aisle was raised, and when these two aisles had been completed the west front of the church was quite a feature. That was the end of the building of the church, bringing it up to the Reformation. The great change which took place in the church was the fall of the old tower on the north side, on January 17, 1692, the tower was issued begging for a fund for the restoration of the church. The tower was rebuilt at the West end, and the old tower was finished to about the level of the roof.

A pleasant ride brought the party to Quen Charlton church, which Mr. Buckle described as an extremely pretty example of a small county church.

Publow Church, with its fine tower, claimed attention, and then the party drove towards Bristol. They accepted the invitation of Alderman E. J. Thatcher to tea at Knowle; and having cordially thanked him for his hospitality, they passed the usual complimentary vote before bringing their three days' meeting to a close.

THE STATE OF THE MAIN ROADS.

AT the Local Government Board last week, a deputation waited upon Mr. Walter Long to put before him the views regarding the state and insufficient width of many of the main roads in the country. Mr. R. Todd, chairman of the Roads Improvement Association, in intro-

ducing the subsoil, and during a forty years traffic in main roads, especially in the vicinity of large towns, had remained almost stationary. Cycles, automobiles, and electric trams had been invented, but there had been no increase in the traffic-carrying capacity of the roads. The result had been to cause a great congestion of traffic, and in the case of London, where only outlets were the only coaching routes, it tended to intensify overcrowding, and immensely aggravated the difficulties of the housing problem. The deputation asked that the Government should take steps to carry out the recommendation of the Royal Commission on local taxation, making one-half of the cost of main roads a national charge; to make the payment of the Government grant conditional upon efficiency to place the administration of that grant in the hands of the Local Government Board, or of the Special Commission subject to the Board, to give powers to the central authority, making it its duty to prescribe regulations with respect to the qualification, appointments, duties, and salary of the office of road surveyors; to make provision for regulations fixing the minimum width of main roads, to simplify the machinery whereby land was taken for public improvements, and to amend the Highways Act.

Mr. Long said the main question which arose in connection with the suggestions for improvement made by the deputation was that of finance. One suggestion was that on condition that a road was laid by the authority for the general convenience of the public the authority should receive money from the State in relation to the cost of that road. But the recommendation of the Royal Commission on local taxation had nothing to do with the general convenience of the public. Their object was to provide relief for the overburdened ratepayers in various parts of the country. It could not be more to apply the cost of the laying of new roads. With regard to what had been said regarding the bad state of many roads and the congestion, he was not prepared to accept the description given. He could not see where their point of congestion applied. It might be that just where the roads leave a town merged into one there might be some little congestion; but that would only apply to very busy towns where the opportunities for widening the roads were restricted by the question of finance. He did not believe that the ratepayers of London, for instance, would be inclined to give the Government money required to purchase the buildings and land that would be necessary in order to carry out the work of widening the roads in the immediate vicinity of the town unless they were satisfied that the disadvantage to the community was so great as to warrant such an expenditure. With regard to the suggestion that a central body should be appointed to have full powers of control over local road authorities, he thought it would be found extremely difficult to persuade Parliament that it was desirable at this time of the day to take powers away from the local authorities and place them in the hands either of a special authority or of the Local Government Board, and he could not imagine that the Local Government Board would ever consent to undertake a task of such magnitude as the control of all roads. He could not see that this was the ultimate result of the growth of self-propelled traffic, and the roads would be of some special provision for that kind of traffic. He could only imagine if any such provision was made it would have to be made very largely at the cost of those who had to maintain them. He had recommended the deputation to put their proposals in the form of a Bill for presentation to Parliament.

THE SECURITY OF ST. PAUL'S CATHEDRAL.

MR. SOMERSET CLAYKE, the architect to the Dean and Chapter, has sent the following statement to the *Times*, with reference to the conflicting reports lately received about the condition of St. Paul's Cathedral:

"Within the first hundred years after the structure of the cathedral was finished the immense weight resting on the foundations of the eight piers which carry the dome and on the foundations of its abutments caused these parts of the structure to sink a little.

"Most unusually rapid spread and sink are the evidences to be seen of the largest possible area, the south beneath them have considerable rather more than under those parts of the fabric less heavily loaded.

"The settlement thus caused has broken the eight piers and the windows of the clerestory over them in the nave, the choir, and the north and south transepts, where they abut on the dome piers.

"In the same way the very great weight of the western towers has caused them to sink. In sinking they have cracked the west front in a diagonal direction through the great door, the window above, and the vaulted ceiling of the portico. They have also cracked through the wall of the chapel to the east.

"It is very rarely that one finds one of our cathedrals with towers or other heavy features which such parts have not been a cause of settlement.

"Such settlements are not necessarily a cause of serious insecurity, but it is obvious that by them the integrity of the edifice is more or less destroyed. Where the structure was intended to be held together by continuous masonry, the continuity is broken. Arches which should exercise their pressure in a definite direction begin to act in directions unforeseen.

"In buildings of painted architecture such deformations are less serious in result than in those where round arches only are made use of. Painted arches will undergo the most extraordinary distortions before they finally yield. The moment a round arch is broken or begins to spread the top flattens and its strength is jeopardised.

"About a hundred years since the development of the before-mentioned settlements gave rise to a system of great iron ties was introduced into St. Paul's Cathedral. These are placed so as to tie back to the dome piers the floors of the north and south transepts; to counteract, in fact, the want of continuity caused by the breaking through of the arches and window already referred to.

"But another movement was also observed, and ties were introduced to counteract it. The transept fronts were found to be settling away from the main fabric, and also themselves to be settling towards the east wall, this being demonstrated by a crack extending vertically through the windows.

"The damage in the south transept was greater than in the north, and has since developed. This we can tell by observing the size of the joints between the stones, many of which, after the ties were run in, were run in with lead, now quite loose and not filling the joints.

"When was well aware that the substratum on which the cathedral was to rest left much to be desired.

"The Medieval builders, as a rule, troubled themselves very little about foundations. When took all precautions that were known or practicable in his time.

"Examining the site of his new cathedral, he found that, passing through the debris of old London, he came, at a depth of some 15ft. or 16ft. from the surface, to a layer of clay or 'pot earth' as he terms it. This varied from 6ft. to 4ft. in thickness. The pot earth rests on a stratum of sand (not at all solid mixed with gravel stones, the lower part wet. Below this, and some 35ft. to 40ft. from the surface, lies the London clay. When thought out of the question to carry all his foundations down to the London clay. He rejected piles, foreseeing that wells or other things might more or less drain off the water from over the clay, and knowing that, unless piles remain always under the same conditions, they must certainly rot. He thought best, by spreading the foundations, to float the cathedral on the bed of 'pot earth,' and thus he built, never dreaming of the desperate attacks the sandy substratum under the pot earth would have to sustain. Had this substratum been left undisturbed, although there would no doubt have been some movement of the structure on the lines of the chief settlement we now see, there is no reason to apprehend that the movement would have continued.

"The very necessary increase of sanitation and of road improvement was probably the first serious attack on the substratum.

"The ground on which the cathedral stands slopes rapidly towards the south and the west. It is fairly level to the east and north. In all directions sewers were made, and at various depths.

"It was proposed in 1832 to bring a sewer at some 39ft. below the surface through the churchyard on the south and east sides of the cathedral. Immediately the danger to the fabric that this

would cause was pointed out, the Corporation of London, which had ever shown the greatest consideration for the cathedral, ordered the work to be stopped. The deep drain in those places has never been made. Unfortunately, it was carried up Goddian-street, almost into the churchyard, and must have done not a little to drain the substratum, especially near the south-west tower. The level of this sewer is considerably below the bottom of the foundation of the cathedral walls.

"Some thirty years ago the Metropolitan District Railway was made under Queen Victoria-street, cutting a large trench along the southern slope of the hill on which the cathedral stands.

"The railway at its nearest point is but 530ft. away—that is, just about the length of the cathedral. The railway is, in fact, a huge trench cutting into the sandy stratum. The disturbance caused by making such a trench was very great. There cannot fail to have been a considerable change in the water-bearing conditions just above the London clay. A cutting once made, the water will always follow it.

"Below the underground railway there has since been pierced the tube for the Waterloo and City Railway. How far this is down in the London clay I do not know.

"We find, then, that the southern slope of the hill on which the cathedral stands is fairly riddled with excavations of one sort and another. There are sewers, the underground railway, and a tube at a lower level.

"The most remote of the railways or tubes is but just 500ft. from the cathedral foundations.

"Those who have studied earth movements, the result of deep excavations, know that a great deal of dislocation takes place in a line diagonally right across the face of the particular excavation. So that the underground railway is 500ft. off does not insure that resultant earth movements do not come much nearer to the cathedral. During the last twenty years fresh indications of settlement have been showing themselves in the walls of the church. The movements are still in progress.

"The movement is observed on the south side. The worst are in the south transept. The way in which these have moved since the ties of one hundred years ago were inserted shows that the settlements are due not to the thrusting of arches in the fabric itself, but to the subsidence of the foundations. The worst is in the south wall from 8ft. to 10ft. thick, 130ft. long, 130ft. high, and weighs between 12,000 and 13,000 tons.

"The arch of the window head is so broken that the great keystone carved with a cherub had dropped more than 2in. from its place. Before the repairs just completed it was quite loose, and was merely held by the pinch of some stones at the base and by the weight of the window. The wall has, in fact, split vertically through the doorway and window over it, sinking gently in two masses right and left.

"The effered window head we see from inside the church is quite out of shape, and the same dislocation in a less degree may be observed over the windows of the clerestory adjoining. The massive iron stanchions intended merely to resist the wind, and to give rigidity to the lead glazing, are now bent by the weight of the window arch pressing upon them.

"It is now going into too much technical detail to state where there are other indications of movement. It is enough to say that they exist on the south side of the church, and we know that some of them have continued to develop during the last three years. They are still developing.

"If we suppose it possible that the subsoil be left from henceforward untouched, the settlements are of sufficient importance to make it necessary not only to watch them carefully, but to expend considerable sums out of a very limited income on their repair. During the last four years the Chapter has had to find the money for such works.

"But now comes the attack by the electric railways. One of these the Victoria, City, and Southern Electric Railway proposes to come under the cathedral, cutting a line between the cathedral and the great warehouses on the south. The centre line of the tube or tunnel would be about 40ft. from the south-west tower and 50ft. to 60ft. from the south transept.

"Another, the Piccadilly and City Railway—proposed to run under Carter-lane, that is to say, under the first street immediately south of St. Paul's churchyard.

"The centre line of this tunnel is at a distance

All for Laying in *Bar Mortar*. Two cubic feet of hair mortar will be required for bedding, and the labour will be 1½ hours tiller, and 1 hour labourer.

2 cubic feet hair mortar at 7½d.
10 cubic feet at 10d.
1 hour labourer at 6d.

All per sq.

Cost per square

s. d.
0 3
1 3
0 6

0 4

3 1

Painting Lead Work.—When pantries are laid to the customary gauge of 10in., a square will be covered by 180. One bundle of laths and 1½ hundred of nails will also be required. Each tile is invariably hung on to the laths or battens by a nail which projects from the upper edge at the back.

180 pantries at 9s. per 1,000 delivered
1 bundle of 12 laths, each 10ft. long
1 hundred nailing nails at 5d. per 100
Labour fixing, 4 hours tiller and labourer
at 1s. 4d.

s. d.
0 16 25
0 3 6
0 0 10
0 3 4

Add 10 per cent profit

1 5 10
0 2 7

Total cost per square

1 8 6

Polys, Vallops, Verges, &c., are calculated in the same manner as shown in Slater's Work.

(To be continued.)

CARDINGTON CHURCH.

ON the site of the church of St. Mary, Cardington, there is doubtless originally stood an Anglo-Saxon church. Fragments of ancient masonry and constructive details prove that this was superseded by a Norman church consisting of a nave and a tower. There is also evidence that in the 13th century considerable alterations were made, including the addition of a chancel with small transepts. From the chancel and its transepts three archways were built into the north, east, and south sides of the tower, the old Norman west archway between the tower and the nave remaining. It was doubtless at this time, also, that a south aisle and porch were added to the nave, and the Early English arcading of the nave constructed, the old Norman work of the upper part of the nave wall remaining, new clerestory windows being inserted in the place of the Norman ones. The church remained in this state until the beginning of the 15th century, when it would seem that the south aisle and porch were rebuilt, and the upper part of the tower added. The discovery of an Anglo-Saxon coffin slab in the walls of the Norman portion of the tower, and of a number of Early English slabs in the upper portion, points conclusively to the above facts. From this date—about 1150 or a little later—no restoration appears to have been done until the walls were, no doubt, replastered, about the year 1750. At that time the old fresco painting was covered with plaster, the walls whitened, high pews introduced, and the edifice, succumbing to the caprice of the "Churchwarden's period," undoubtedly lost most of the Medieval characteristics it had until then retained. The south porch was done away with, and a new window—to match the others—was placed in the south wall. The most curious relic of early times was the arch between nave and chancel, a fine example of Early Norman, with broad, flat jambs, and flat sloat resting upon simply moulded impost. The demolition of the holy of the church, together with the old tower, was made necessary by the unsafe condition of much of the masonry in the south, east, and west walls of the south aisle. The wall of the aisle was found to be 6in. out of upright. It was then resolved to rebuild the tower upon its old site. Mr. Whitbread being most anxious to interfere as little as possible with the ancient plan and the archaic details of the church. But on examining the tower foundations and the ground in the interior of the tower, it was discovered that the great number of internments had so thoroughly honeycombed the soil as to make it inadvisable to place a heavy tower-structure on the site. It was then decided to throw the tower-structure into the nave, and to add a new tower to the west end. As a north aisle was also being added, thereby widening what was already a short church, the removal of the tower to its new site very considerably improved the proportions of the whole building. The only part of the church that has not been reconstructed are portions belonging to

the patrons (Trinity College, Cambridge)—viz., the roof and walls of the chancel, the east window, and the tombs in the chancel. The old windows in the chancel have been reconstructed in precisely the same position as before, with the old materials. No care or expense has been spared in securing good foundations for the new building. The foundations of the tower and of the four western nave pillars are carried through the bed of the water-bearing gravel to the clay beneath—viz., through 5ft. of soil and 5ft. of gravel to the clay beneath, the water being assuaged by wood casing. The tower rests on a bed of the strongest concrete, 15ft. square by 1½ft. thick. The work of the tower foundation, as well as that of the foundations of the four nave pillars, was carried out from plans prepared by Mr. James Briggs, M.I.C.E., Derby. In the construction of all portions of the church the best and most durable materials have been employed. The stone for the walls is from Tinsley Moor, a block, and is laid in random-coursed work; all the new dressings are of Ketton stone (Rutlandshire); the base on which the oak pulpit stands is from Bagger's Well, Staffordshire; the steps on which the font stands are of stone from Hollington, Staffordshire; while the font itself is of hard white Mansfield stone. No ordinary mortar, nothing but the best cement, has been used anywhere in the building. The outer roofs and waterpipes are of copper, and the locks are of gunmetal.

The whole of the work of plans and designs—including new tower superstructure, north aisle, transept, and south porch, and all new architectural details—has been carried out by Mr. George Higginson, F.R.I.B.A., who has been very ably assisted by G. G. T. Fields-Clarke, F.S.I. (and steward to Mr. Whitbread) in the general superintendence and carrying-out of the various and sometimes intricate details connected with such department of work. The old walling and dressed stonework has been under the formanship of Mr. John Sletcher, and the woodwork under that of Mr. John Hannam (Mr. Whitbread's estate foreman). The ironwork on the doors, &c., has been wrought by Mr. L. Franks, the estate blacksmith. All the carved woodwork, including the beds, has been executed by Mr. Elmes, of London. The glazing was done throughout by Mr. A. Bass, the estate painter, and is a fine example of the glazier's skill. It is specially worth recording that R. Arber, of Bedford, placed every dressed stone throughout the church in the same position as the original, which were fixed by T. Bailey, of Olney. This, and the fact that the whole of the work, extending over four years, has been carried out and completed without a single accident to the numerous workmen employed, is unique in a building of this kind. The church, as restored, is as follows:—Height of tower, 74ft. to the top of the battlements, the turret rising 8ft. higher; total length of building, including tower, 132ft.; width of nave 20ft. 10in.; width of north aisle, 13ft. 2in.; width of south aisle, 11ft. 8in.

The building is consistently and richly perpendicular in style. All the roofs are embattled. The upper stages of the shorter buttresses and the middle stages of the tower buttresses have cinquefoiled panels in pairs, with smaller bifoliate panels above. The tower has a western door, a trifoliate chancel window, a trifoliate chancel trifoliate lights in the tracery, and two-light cinquefoiled belfry windows in pairs on each side, except on the north, where a part of the tower is covered by the octagonal projection of the newel-turret, which rises above the tower roof.

The south porch is of good dimensions, and adds much to the beauty of the south side of the church. The outer archway is four-centred, with a square head inclosing spandrels bearing floral designs. The deep moulding of the arch runs uninterruptedly to the ground. A carved finial rises from the key of the arch, and the space on either side of the spandrel and above the tracery of the cornice of the embattled gable is filled with arcades of cinquefoiled ogee arches.

The inner arch is—as mentioned above—the reconstructed arch of a formerly existing porch, the stones of which were found buried on the spot. The north wall of the transept is richly decorated with an arcade of ten arch panels, similar to the arcades on the west front of the tower and the south wall of the porch. The Norman arch of the tower has been already described. Including the arch of the space formerly occupied by the central tower, the nave has an

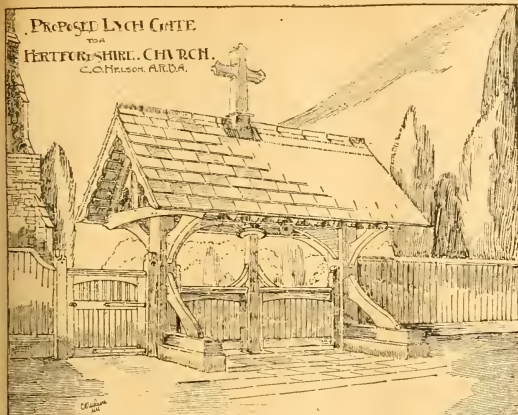
arcade of four bays. The arches and caps are variously but harmoniously moulded. All the head-moulds terminate in large floral scrolls. The columns are moulded into four circular shafts, and the responds have cinquefoiled moulding. The chancel arch is lofty and richly moulded. The arches from the aisles to the aisles of the chancel are of a four-centred character, as are those from the aisles to the old tower space; the responds of the arch into the southern chancel aisle differ from the others in having a concave fillet between the semicircular mouldings and terminating in floral brackets. All the windows in the aisles and in the chancel aisles—with the exception of the west windows, which have only two lights each—have three cinquefoiled lights, and the windows in the chancel have three windows and exact reproductions of the old aisle windows. Each chancel aisle has an eastern window and two windows in the side walls, and each aisle has three windows in the side walls and one at the west end. There is no north door, but an arch in the masonry. Towards the corresponding position, wall of the old north aisle, in which a Norman doorway originally existed, but was filled up in the early alterations to the church. The stones of this arch are those that were in the old wall. The clerestory has seven two-light windows on the south side, and five on the north side, where a part of the space is occupied by the transept. The transept, which is adapted to the Whitbread monuments, has three windows above, and two windows at the sides of the principal moulding. The restoration revealed three ancient piscinas, covered with plaster. These have been left in their position—one in the north chancel aisle, and two in the south chancel aisle. It is noteworthy that no coins or papers were discovered in or under any part of the old building.

There are two steps to the choir, and two to the altar. The east window—the only coloured one in the church—is in memory of William Henry Whitbread. The recos is a series of richly ornamented panels, four of which contain the Doxology, &c. The chancel is separated from the chancel aisles by handsome carved stone screens, and the altar is raised on altar tombs and brasses of Sir W. Gascoigne and Sir Gerard Harvey. On the north side of the choir is a fine new organ, constructed by Mr. Trustum, of Bedford, from the specification of Mr. H. Clarke. The case is designed by Mr. Whitbread. The east end of the north chancel aisle is screened off by a vestry. Handsome oak choir stalls occupy the choir. The church is fitted with capacious oak sittings. An elaborately designed pulpit in English oak, standing on the south side of the nave, is the gift of Mrs. C. and Miss Elizabeth Whitbread. The monuments of the Rev. J. H. Hillier, of Hillier, A new brass tablet, the gift of Lady Isabella Whitbread, stands under the chancel arch, and bears a large old Bible, printed in 1770, on the cover of which is a gift label with the inscription:—"Cardington Parish. Rev. Maurice Farrell, Curate. Thomas White, John Hickman, Churchwardens, 1839." The font—already mentioned—is the gift of the vicar (the Rev. E. J. Hillier). It stands at the western end of the south aisle. The basin is seven-sided—seven being a sacred number—and the front panel is filled with a carving of the descent into the tomb. The top of the basin is cinquefoiled arches. The idea of seven is repeated in seven rays of light issuing from the Dove. The font is supported by seven small granite shafts with stone bases and caps, round a central shaft.

The roofs of the chancel and aisles are plainly painted. The roof of the nave has massive moulded beams with bosses and embattled crests, queen-posts, and collar braces. All the roofs are of the best English oak. The church is handsomely floored with white Mansfield stone and black marble.

The reconstruction of the church as restored, thus given in detail, can scarcely suggest to the reader the fine appearance of the building as a whole. There are few churches in the Midlands, whether in town or country, that excel or even equal it in characteristic features.

The London County Council and its committees, having risen for the summer vacation, the name of the new street from the Strand to Holborn will not be decided until the next September. The Improvement Committee have received innumerable suggestions as to the nomenclature of the thoroughfare, and have whittled them down until about 70 or 80 remain for the further west-lung-out process.



LYNCH-GATE, HERTFORDSHIRE.

THIS lynch-gate to a Hertfordshire church is proposed to be erected in *memoriam*, and to be constructed entirely of oak. Mr. C. O. Nelson, A.R.I.B.A., of Holborn, is the architect.

LAYING TILE.

THE space to be covered with wall tiles, says Mr. H. A. Hopkins in the *Scientific American* (Building Edition), should be either riven diagonally or metal lathing, not small wire net, but pressed metal having a good deep indentation which will form a strong key for the ground or scratch coating. This coating gives the best results when composed of three parts of sharp sand to one part of the best Portland cement. If brick walls are used, the joints between the bricks should be scraped out, at least $\frac{1}{2}$ in. in depth, so as to form a good key for the scratch coat. This coating should be brought out within $\frac{1}{2}$ in. of the finish of the tile wall. Before this coating gets hard it must be roughened by scoring or marking with the sharp edge of a trowel, making cuts at least $\frac{1}{2}$ in. or more in depth, and running diagonally across from left to right, and recrossing from right to left; always starting from top of wall cutting downward. This is done in order to give a key to the top coat which holds the tiles in place. Allow the scratch coat at least twelve hours to set before beginning to affix the tiles, each tile being set separately in its own bed of top coating buttered, this coating being put on the back of the tile, and the tile tipped into place with the handle of the trowel, and each every tile being thus set into place until the wall is completed.

The foundation of the floor should not be less than 4 in. in depth, and should be composed of four parts of sand to one of best Portland cement, and brought up to within 1 in. of top of finished floor. The top coating which holds the tiles in place should be of the same proportions and materials as the scratch coating. After the top coating is screed smooth ready to receive the floor tiles, it should be lightly sprinkled with dry Portland cement.

Much dissatisfaction has been caused by the walls being floated. Straight-edges are set and the top coating brought out to within the thickness of the tiles used, and in the finished wall all the tiles are laid against this floated coating; they are beaten in place with a board and hammer. Now just as soon as this coating is put on it begins to set, the water used in mixing the material runs to the bottom of the wall, leaving the top dry, and it sets much more rapidly than the bottom; and by the time the last row of tiles is put in place at the top of the wall the cement is quite hard. Much precaution must be used when beating with the board and hammer lest the top row of tiles be broken, while at the same time the cement is soft at the bottom of the wall, and if beaten too

hard it begins to run or settle, causing lumps at the base, extending sometimes half-way up the wall. To make tiles hold to cement all the air must be excluded from between the tiles and the cement. A wall affixed as above will surely come loose in course of time, because it is almost impossible to beat the air from between the tiles and the cement when the above conditions prevail.

I have often seen a space 5 ft. by 8 ft. floated on a wall, and not one of the tiles tapped into place until after the entire wall was set in place, and after being slightly beaten with board and hammer, was called finished. Floated walls can be made to hold by doing a small section at once; if the wall was floated half-way up to 2 ft. 6 in., and then covered with tiles, and carefully beaten, and then floated the other half, and carefully beaten, very few, if any, loose tiles would result; at least they would never show themselves until the building settled. The pinching and cracking of this large sheet of cement, 5 ft. by 8 ft., caused by undue strain on one end or the middle, would loosen most of the tiles, and to repair the same would necessitate the taking down of the entire wall, which would not be the case with a battered wall, as each tile has its own bed, and would give slightly to the strain caused by the settlement of the building. The affixing of a couple of dozen or more tiles would make the wall as good as ever.

Trouble is caused in a great many instances with tiled floors by using two kinds of cement; a cheap grade in the foundation, and best Portland for the top coat. Thus the top coat and the foundation expand and contract differently, one expanding or contracting more or less than the other, and as two different grades of cement will stick together, an air space is formed between the top coat and the foundation. Should any heavy weight be dropped or carried over the floor thus set, it is more than apt to crack it, and in many instances cause the tiles to come loose. The top coating is from $\frac{1}{2}$ in. to 2 in. thick; if cement is floated over a floor more than $\frac{1}{2}$ in. thick to receive the tiles before the tiles are beaten down, the cement that is mixed with the sand has settled to the bottom, thus leaving nothing more or less than dirty sand between the top coating and the tiles. This is why the top of the screeded cement must be sprinkled with dry Portland cement. In order to assure a hold for the tiles, as the dry cement will not settle as quickly as that which was mixed with the sand, the tiles that will be beaten down. Many a tile floor has been permanently spoiled by the employment of the ordinary mason or unskilled labourer. It must be borne in mind that an ordinary sized floor sometimes costs hundreds of dollars, and the affixing of the tiles should only be entrusted to the eye of a skilled tile-layer. If our architects will carefully note these few facts about tiles and their proper affixing when writing their specifications, it will save them much trouble.

White, blue, green, and pink coloured tiles are

the best for bath-room floors, as all these colours are vitrified, and absorb little or no moisture. It makes no material difference as to the size or shape of tiles used. Glazed tiles should never be used for floors, as traffic soon destroys the glaze, and as the bisque is soft and very porous, they absorb a great deal of moisture and soon become discoloured and unsightly.

EGYPTIAN BEADS.

AT the last monthly meeting of the Society of Antiquaries of Newcastle-on-Tyne, Mr. R. C. Clephan, F.S.A.A., was thanked for exhibiting a selection from his collection of Egyptian beads ranging in date from 4000 B.C. to the Roman occupation. Mr. Clephan explained that Egyptian beads occupied an important place among the objects of the faience of that ancient civilisation, and they were especially interesting in regard to their form and colour. Beads were perhaps more purely decorative than ornaments that were more directly symbolic like scarabaei and the numerous allegorical figures and emblems representing the extensive pantheon and general imagery of ancient Egyptian life and thought, and these figures and symbols were much used as pendants attached to bracelets, collarettes, and necklaces of string beads, and they were in fact worn as phylacteries or amulets.

It was not to be supposed, however, that even the simpler forms of beads had not been conceived in a spirit of symbolism like the simple spheroid, which was emblematic of Ra, the mid-day sun. The significance of many had become lost to them like the myths themselves that had suggested and inspired them. When considering the social life of ancient Egypt and its accessories one was apt to forget that they were dealing with a period of 5,000 years, and that the "children of Stoa" were just beginning to assert themselves as the living and ruling predecessors of Menes; and some of these demi-gods were not unlikely before long to become historic. What changes must have taken place over this extended period, and still the most ancient ferna and traditions had been wonderfully handed down over its whole course.

Many of the specimens exhibited, he continued, had been picked up singly among the sands bordering on the desert; but the necklaces and best-preserved specimens of single beads all came from tombs, and had been used as decorations for the mummified dead. The forms of the beads of the Old Empire were usually round, oval, or square, after which period they included various adaptations of the prism, the spindle, the lozenge, and the lotus column; the last-named form symbolised eternal youth, and when cut in carnelian the blood of Isis was typified. The field of the Egyptian lapidary was an extensive one, comprising most of the precious stones of that day, with the notable exceptions of the diamond and the sapphire. Rubies were often stated to be absent, but this seemed to be doubtful—at least, as far as the dynasty of the Ptolemies was concerned. Beads, besides those cut in precious stones, were fashioned in malachite, carnelian, onyx, rock crystal, coloured glass, alabaster, diorite, the finer kinds of limestone, besides amber, pastes, and clay. Some were glazed, enamelled, or painted in rich colours, which were mainly derived from metallic oxides. The columns of the vitreous fluxes used were excellent, the imitation of the rich shades of the turquoise and lapis lazuli being very close indeed. Green was the colour most affected during the earlier dynasties, a malachite green, probably suggested by the mineral itself; but in latter ages the different shades of blue was the favourite colour.

DRYING-OUT A QUICKSAND.

DIFFICULT sewer work was necessary last year in building a surface-water drain for Goldsmith Brook, West Roxbury, Boston, Mass. A bed of quicksand was encountered 60 ft. below the grade of the conduit, and borings showed no stratum of gravel through which the quicksand, pumped in order to clear out the conduit. Puhlar wells were sunk 20 ft. to 25 ft. below grade, surrounded by gravel, through which the quicksand filtered to the well. The method adopted to accomplish this was first to sink a 16-in. pipe by means of a water jet, then to place inside of it a 2½-in. pipe, perforated for about 5 ft. at the

bottom. The smaller pipe extended down to the bottom of the large pipe. The space between was then filled with coarse sand, and the large exterior pipe withdrawn, leaving the perforated pipe surrounded with coarse sand. The water which filtered through was then pumped from the 2½ in. pipe by means of a steam-ejector nozzle, placed at the bottom of the 2½ in. pipe, and connected with a still smaller pipe in the interior of the 2½ in. pipe.

MODERN DEVELOPMENTS IN REFUSE DESTRUCTION.*

By G. W. MELVIN, Leeds.

THOUGH the whole history of scientific destruction of refuse by fire is, when counted by years, of short duration, yet it may be divided into periods comparatively ancient and modern. Until ten years ago, many men who were deeply impressed with the necessity of disposing of town's refuse by this method instead of tipping it on the land, thought that the chief source of disease struggled with furnaces of different types, none of which fulfilled the requirements of a perfect incinerator; but it was only when, by the aid of forced draught, a sufficient temperature was produced in the furnace itself—namely, ranging from 1,000 to 2,000 Fahr.—that the destructor could be considered fit to carry out its task in a satisfactory manner. The introduction of forced draught has revealed the fact that town's refuse has considerable calorific value, and that the process of destroying liberates a great amount of heat available for various purposes. This heat is utilised by placing at a convenient point after the hot gases have united in the main flue a boiler of improved type. The "water-tube" type of boiler meets with great approval, though the "Lancashire" type has many adherents. Provision in either case can be made for cast-iron where the work required to be done is urgent, so that when there is a short or bad supply of refuse there may be no cessation. On the other hand, many extravagant statements are made, and some enthusiasts consider that the heat which will be lost is a handsome profit towards the relief of the rates. We have not arrived at that stage yet. The most popular way of utilising the heat is in connection with works for electric lighting. It is sufficient to mention such towns as Liverpool, Oldham, Ashton, and Burnley, and in the United Kingdom the Metropolitan Boroughs of Fulham and Shorehith, where success is claimed in this matter, and many councils for other places have entered into contracts which will enable them to share like benefits. Probably 30 to 40,000 l.h.p. is obtained daily for this purpose in the United Kingdom from refuse alone, and before another year elapses this amount will be more than doubled, taking this at a price of £1 per l.h.p. per annum; it will be seen that the community will soon be saving a quarter of a million of money in fuel for electric lighting by treating its refuse in a rational manner. The pumping of sewage will be wadely carried out in the future by heat from the destructors. The general work of a town's yard, such as stonebreaking, slab pressing, mortar making, clinker crushing, driving the workshop for general repairs, chaff cutting, &c., are all carried out. Oldham was the first town to utilise the surplus heat from the destructor in connection with its electric light, as the regular supply of high-pressure steam to the electric light station commenced in March, 1896. The success there induced other councils to follow, and now very few destructors are installed which are not intended to furnish power which can be profitably employed. The amount of surplus heat procurable differs widely according to district and time of year. In a North-country town, where coal is comparatively cheap for general repairs, chaff cutting, &c., the use of the gas for greater value than that procurable in a South-coast town, where gas stoves are largely employed for cooking in summer, and where in winter the price of coal compels users to be thrifty with their kinders. In the former case, of 1 lb. of waste will probably evaporate 1½ lb. of water, while in the latter probably not half that quantity of water would be turned into steam. With reference to the tables of results of tests so often published, we would draw the attention of intending purchasers to the duration of these tests. Although any modern furnace can make a good show for six, eight, or ten hours,

but no test to our mind, will be of the slightest value which does not cover a period of 24 hours. Makers who value their reputation will always insert this as one condition in their contracts. From refuse itself, we have, in modern furnaces, been able to extract the last unit of heat it is capable of supplying, and, with a slight regret, disposing of the residuals in the most complete and profitable fashion. House and trade refuse is quite unpleasant enough when allowed to stand for a few days in the dustbin or ashpit. When collected and deposited in large quantities in readiness for the work of the destructor, its odours become acerbated, and the inhabitants do not care to have the destructor placed where they are likely to find it a nuisance owing to the accumulation. Engineers have endeavoured to so arrange the plant that each load, without being exposed or handled, can be shot right away and delivered into the destructor, and this has again been until the resultant clinker is withdrawn. At a destructor specially built for the Strand Road of Works this idea has been fully worked out. The refuse to be dealt with—though not containing any wet asphalt materials—is of a very inextinguishable character. Covenanter's footings forming a large proportion of the bulk—boxes, baskets, barrels, warehouse refuse, paper, street sweepings, and brewing rubbish forms the remainder. In order that this specially difficult and miscellaneous rubbish may be instantaneously delivered into the furnace, the plant is arranged so that difficulties have had to be overcome. The shape of the feed-holes has had to be ascertained by actual experiment. To receive the varied materials in such immense bulk necessitates the use of a feed-hole of very large dimensions, and consequently of very large size. To make this feed-hole-tight, and to provide every means of actuating it, has also proved a formidable task. A water seal has been adopted, into which the edges of the lid are dipped, means being provided to raise the lid a few inches before drawing it back to open the feed-hole. When the lid is to be fed, the door is raised, it is driven up, the lid lifted, and the load discharged; a process occupying a little over a minute. This load, if shovelled on to the fire, would take two men at least a quarter of an hour to deal with it. One man will easily be able to feed a dozen destructors with 120 tons per day, and not only there is a great saving of labour and no handling of germ-laden matter by the men, but the wages bill is greatly reduced. Every time a shovel is put into the refuse some dust is of necessity distributed. The introduction of the centrifugal dust-etcher in connection with the Horsfall system of destructor has been a great boon. In Edinburgh, four years ago, it enabled the council to carry on its destructor, which previously was under the ban of an injunction, and which would have had to be discontinued. At St. Albans, Clifton, and several other towns, the vestry, and rescued the authorities from the clutches of the law. Its shape and arrangement are such that all dust which escapes from the combustion-chamber, boiler, and main flues is effectually trapped, allowing only clear gases to pass into the chimney top. It converts the smoke escaping from a shaft into a fine white dust which is of yellow tinge, dust is present, and when some distance away the special and peculiar smell of a destructor greets the olfactory nerves, a fine, perhaps impalpable, dust is the dust which can be removed easily and quickly from the dust-chamber, and which has and it has become so calcined that it is used in many places as a basis for carbolic powder. Those who have visited destructors know that the process of clinkering is hard for the men. This has been recognised very considerably by the introduction of Messrs. Cox and McPhee's overhead clinker railway. A tipping-bucket is suspended from a rail, upon which it travels on rollers. It is slipped into its place under the clinkering-draw, and as it will contain about double the quantity of an ordinary barrow can hold, the clinker is all drawn at once, and the work is considerably expedited. It is drawn along the rail instead of being pushed like a barrow, so that the operator does not need to encounter the fumes of the red-hot clinker, and when the desired spot is reached, is tipped over,

and the contents cooled off. If the incineration has been properly carried out, the clinker, mixed with its due proportion of lime, makes the finest mortar, and in many towns realises a good price. We cannot do better than quote what is being done in Bradford. Speaking before the British Association last year, Mr. McEaggart, the chairman here, mentioned that the clinker and cost the Corporation of Bradford over £1,000 per annum to cart the clinker to tips. Since that time, however, we have been very successful in our efforts to utilise in various ways the large amount of clinker we produce. Additional mortar machines have been ordered, clinker crushers, and screening machinery have also been introduced, with the result that from two of our destructors, Hammerton-street and Cliffe-road, we sell the whole of the clinker produced. At Sunbridge-road we dispose of one-half at the present time, and at Southfield-lane machinery is being installed to utilise the whole production. At the present time we have eight mortar mills at work, and we are turning out mortar at the rate of 12,000 tons per annum. During the twelve months ended March 31, 1900, we sold 15,000 loads of screened clinker in various sizes, and 84, per load, produced a revenue of £500. Had we been compelled to remove this, as in former times, the cost at 1s. 5d. per load, the price paid to the contractor, would have amounted to £1,060 plus the cost of tipping. We produce about 1,000 tons of clinker in four sizes. It has been extensively used for concrete work in connection with the recent tramways extensions in Bradford; at the electric power stations extensions in foundations and engine-beds, and in the sewage and street-cleaning departments, while the finest No. 3 size is eagerly purchased by plasterers to make the clinker in river sand. Another method of profitably utilising this residuum is in the manufacture of artificial stone. We have lately installed at our Hammerton-street works a complete hydraulic plant for this work, not so much with the object of utilising the clinker, but with a view to rendering it more utilisable the steam produced. The installation comprises a powerful hydraulic press, working at a pressure of two tons per square inch. In conjunction with this press are two sets of moulds which enables us to keep the pressure constant, and the material being under pressure while the other is being filled. The machine is capable of producing 200 slabs per day of 9½ hours. The slabs are made in a variety of ways, some with a facing of granite chippings and Portland cement, ½ in. thick, in the proportion of three parts of cement to one of slabs, which is 2½ in. thick altogether, being composed of clinker and cement in the same proportions. Perhaps the most profitable way of utilising clinker, especially when large quantities have to be dealt with, is in the manufacture of concrete bricks. The bricks, when made from a 10 per cent. mixture of hydraulic lime and clinker, and properly seasoned, are nearly 50 per cent. stronger than the ordinary building brick used in Bradford, and can be manufactured at 14s. per 1,000. For utilising large quantities of clinker in districts where its sale in other forms is limited, the use of concrete bricks is a very profitable method. Turning out 8,000 bricks per day will require over twenty tons of clinker for that purpose. We have an artificial manure plant at work at Hammerton-street, where the whole of the fish refuse of the city is treated, and converted into valuable manure. The plant consists of a large steam-jacketed pan, having a central shaft passing through stuffing-boxes at either end, in which are attached a number of arms or agitators, which are kept revolving when the pan is at work by means of powerful gearing driven by a steam engine. The fish refuse, mixed with steam from the jacket, is fed into the pan, a double duty being thus obtained from the steam. We deal with 600 to 700 tons of this refuse per annum, which is reduced to 25 per cent. of its original bulk. The product we sell at 63 per ton at our works, and this is very profitable, the recent machinery having been very little attended to. Wm. Newton Bradford particularly, but Birmingham, Manchester, Sheffield, and many other towns are partially carrying out the same plans, and there is no reason why every large town should not have as complete a scheme of utilisation of residuals as Bradford.

A brass tablet has been placed in the north chancel of Birkin Church, near Pontefract, in memory of the late reactor of the parish.

* A paper read before the Royal Institution of Public Health at Edinburgh.

KING'S COLLEGE, LONDON.

The following are the results of examinations in order of merit in the evening department of Architecture and Building Construction:—

BUILDING CONSTRUCTION.—Silver Medal and £2 in Books, F. J. Jones; Bronze Medal and £2 in Books, G. H. Briggs; 1 in Books and Certificate of Distinction, G. Thomas; Certificates of Distinction, Laker, Crow, Black, Berry, Fenn, and Ixer; Certificates of Merit, Alexander, Davies, Horsfield, and Mickle.

CONSTRUCTION, DRAWING.—£3 in Books and Certificate of Distinction, Nicholl; £2 in Books and Certificate of Distinction, Mickle; 1 in Books and Certificate of Distinction, Hampshire; Certificates of Distinction, Gomme, Ixer, Bale, and Berry; Certificates of Merit, Crowe, Bowler, Black, and Briggs.

TECHNICAL.—£3 in Books and Certificate of Distinction, Jones; £2 in Books and Certificate of Distinction, Davies; 1 in Books and Certificate of Distinction, Davies; Certificates of Distinction, Black and Horsfield; Certificates of Merit, Hartnoll, Alexander, and Frost.

SANITARY CONSTRUCTION.—Sir George Faudel Phillips' Medal not awarded.

HISTORY OF ARCHITECTURE.—Silver Medal and £2 in Books, F. L. Hampshire; Bronze Medal and £1 in Books, A. E. Brooker; Certificate of Distinction and £1 in Books, S. A. Mickle; Certificate of Merit, J. A. Gillett, W. Fenn, G. W. Rogers, and J. Byrd.

SCIENCE AND SKETCHING CLASSES.—Bronze Medal and £1 in Books, A. E. Brooker.

ARCHITECTURE.—Silver Medal and £3 in Books, S. A. Mickle; Bronze Medal and £2 in Books, A. E. Brooker.

CONSTRUCTION.—Scholarship for One Year and Silver Medal, R. Fenn; Scholarship for Two Terms and Bronze Medal, H. S. Jones; Scholarship for One Term, M. S. Nicholl.

Particulars of the two free scholarships for the evening classes offered by the Carpenters' Company will be fully advertised.

BY-LAWS AS TO HOUSE DRAINAGE AND SANITARY FITTINGS.*

THE usefulness of an annotated handbook relating to the by-laws as to house drainage made by the London County Council will be admitted. Mr. Gerard J. G. Jensen, C.E., author of works on drainage, and another, have brought out a work of this kind containing references to the by-laws of various cities in the United Kingdom. The book comes none too soon, now the Local Government Board have sanctioned the new series of by-laws framed by the L.C.C. under section 202 of the Metropolitan Local Management Act. These by-laws have opened a new era for the administration of a uniform code of regulations for house drainage and sanitary fittings in the Metropolis. The authors have attempted to indicate the "best and most practical method of giving effect" to the intentions of these by-laws, so as to prevent misunderstanding or wrong interpretation. In fact, the by-laws will be found of use to all party architects, surveyors, and builders in London and in all urban districts, as the latter by-laws are based upon those of the Model By-laws of the Local Government Board, which have been closely followed. The authors have also compared the by-laws with others adopted in a number of the chief cities of the United Kingdom, and differences have been referred to in footnotes. The work is well illustrated by diagrams, plans, and fittings, so that the least intelligent owner or builder will be enabled to understand the purpose of each regulation, such as that referring to subsoil drains, and disconnection, to the ventilation of drains, to waste-pipes, discharges, and traps, jointing of iron soil-pipe with stoneware, and many other details that are often misinterpreted or evaded. The powers conferred upon the sanitary authorities of London by section 73 of the Metropolitan Local Management Act, 1855, to require the owner of a house within the limits of a sewer to construct a drain and branches of certain size and material, fall, &c., have long been a source of trouble and misunderstanding. All kinds of subterfuges have been attempted to satisfy vestries and boards. Not until the present year has any uniform code of by-laws been in operation in the Metropolis. One vestry or its successor at a time has adopted a code of its own, and required one standard, another vestry, quite a different arrangement, the consequence being no uniformity of procedure was possible, each local authority having its own views. No by-laws existed to regulate underground drains, and the sanitary authorities adopted various plans or none at all. The authors adopt two codes of by-laws, the first made under sect. 39 (1) of the Public Health (London) Act with respect to water-closets,

earth-closets, ashpits, &c. and the second code, formed under sec. 202 of the Metropolitan Local Management Act, 1855, for regulating the fittings, drains, fittings, and mode of construction, &c., of pipes, drains, and other means of communicating with sewers, &c. The two codes deal comprehensively with the whole subject in houses newly erected, and in those already existing. We can recommend Mr. Jensen's work to all interested in the drainage and fittings of buildings in the metropolis, excepting the City, which is exempted from the by-laws made by the London County Council.

DIFFICULT FOUNDATION WORK ON A NEW YORK APARTMENT HOUSE.

THE 90ft. by 90ft. Park Realty Building, at 63rd & 3rd and Madison Avenue, New York, is a 12-story steel-case apartment hotel which is being built on made ground where considerable difficulty is experienced with the foundations. These consist of 38 solid concrete piers which are being carried down to solid rock from 30ft. to 40ft. below the level of the cellar floor of the building, which formerly occupied the site. Wherever practicable, the piers are built in pits made in open excavation with sheet pile sheathing. They are generally circular, with the piles driven around segmental timber rangings, which are removed when the concrete is rammed in the pits up to the level of the cellar floor. The material of the fill is largely composed of earth and clay, through which the pits are being sunk with a moderate amount of pumping, but in some places the fill is almost entirely of rock, much of it in large sizes, so that it is almost impossible to drive short piles through it.

As it is so difficult to sink open pits, cylindrical wooden-stave pneumatic caissons are substituted. These are all made in 25ft. lengths, and have sections of cofferdams added to the upper ends when necessary. Most of them are 6ft. 6in. in diameter, but a few are larger, up to 10ft. All of them have steel cutting edges, removable cones of cutting, and the working ends of the caissons are well planed and splined staves bolted to inner horizontal angle rings, and correspond to those illustrated in the *Engineering Record's* descriptions of the Atlantic Mutual Building, the Fabri residence, and other buildings. Alongside the party-wall of an adjacent building all the piers are built in caissons which are sunk with bevelled cutting edges, lowest near the lot line, to prevent the escape of compressed air there. Braced timber guide frames are built to inclose the upper ends of the caissons when first started, and the staves are smeared outside with grease to facilitate sinking.

Between two adjacent buildings where their brick party-walls supported on steel needle beams during the construction of the new substructure. One wall is being underpinned and has been lifted bodily a fraction of an inch on groups of three or four 15in. steel I-beams set close together in the groups and about 6in. apart, but in some groups. These beams are sunk about 30ft. long, and are supported by jack-screws on timber cribbing under each end. The ends of the beams project only a short distance into the cellar of the adjacent building, so that the opposite ends extend a long distance beyond the wall to the new building and leave room between the supports for unobstructed work on the underpinning. Between the groups of beams the 4ft. or 5ft. lengths of brick wall are supported by rows of jack-screws set on short timbers under the footings, and removed as necessary to allow the new work to be built. One of the old walls does not need to be underpinned, but to detect any movement on groups of transverse I-beams which have jack-screws only under the long ends, and are carefully watched and adjusted if necessary to compensate for any settlement in the soil around the foundation pits. Permanent marks have been made on the wall and instrument sights are made on them daily to detect any movement in the wall. The beams are screwed up to keep the wall exactly plumb and to carry as nearly as possible about a half of its weight, and relieve the ground under the footings of some pressure until the new substructure is completed.

Mr. Mackintosh and Fox are the architects of the building, Messrs. Purdy and Henderson are the consulting engineers, the George A. Fuller Company is the general contractor, and Mr. J. F. O'Rourke is sub-contractor for sinking the pneumatic caissons.—*Engineering Record*.

Building Intelligence.

Bristol.—The detailed plans for the Museum extensions and Art Gallery are approaching completion, and the work will shortly be commenced. Sir William Henry Wills recently promised that if the Corporation would spend £10,000 in connection with the Museum extensions, he would undertake the cost—estimated at £20,000—of completing the building so as to make it suitable for a municipal art gallery. The Salisbury Club for adjoining the Museum, was secured, the buildings thereon are to be demolished, and on the area thus provided a building will be erected, the ground floor of which will be devoted to the purposes of the museum, and the floor above will be the art gallery. The plans were prepared by Mr. Frank Wills, in association with Messrs. Houston, of London. The ground floor will consist of two large rooms, one 63ft. by 35ft., and the other 63ft. by 33ft. 3in., and two other rooms, 44ft. by 29ft. 6in. The art gallery on the first floor will comprise two large rooms, 44ft. by 30ft.; two smaller rooms, each 33ft. by 30ft.; and a fifth room, 47ft. 6in. by 30ft. The basement will contain storage rooms, workshops, &c., and there will be a lift from the basement to each floor.

Cardiff.—Roughly speaking, the value of the work done on the new town-hall and law-courts in Cathays Park, Cardiff, up to the present is £30,000, out of a contract price of some £40,000, a quarter of a million. So far the principal work has been in laying the foundations, and on the general line of the building they are laid to a depth of 9ft. below the ground floor. The work was everywhere found to be good for the foundations, and it was only in one part that a difficulty was encountered. This was in the north-east corner, where deep excavations for the boilers took the operations below the level of the sewer. The law courts are not so forward as the town-hall, mainly because the foundation work has been heavier, the walls thicker—especially where the cells are—and inside the four-square of the exterior there is the complicated arrangement of foundations on which the various courts and rooms have to be built, instead of the large, light areas that form quadrangles in the town-hall. But the law-courts are rising out of the foundations, and are up to the ground floor level in nearly every part. The contractors are Messrs. Turner and Sons.

Chorlton.—On Thursday week the new Wesleyan Chapel which has been erected at Chorlton, near Nantwich, was opened. The original estimate of the cost of the building was £770, but this sum has been exceeded, the total expense incurred totalling £859 18s. 6d. Included in this sum is an item of £30, representing the cost of furnishing, and other minor expenses amounting to £59 18s. 6d. The new chapel, which was designed by Mr. E. E. Davenport, and built by Mr. Gresty, of Willaston, is in the Gothic style. The walls are faced with Ruskin bricks, and the building has an ornamental front. Accommodation is provided for over 100 people.

Church Stretton.—A new hydro has been opened at Church Stretton on a spur of the Longmynd, 800ft. above the sea level, originally known as "Tiger Hall." The building is situated in the midst of over ten acres of forest, the fully wooded grounds, which slope down to the main road leading from Church Stretton to Hereford, and is within easy distance of the railway station. The hotel, which is four stories high, contains, on the ground-floor, entrance-hall and lounge, staircase, hall, and lift, dining-room, by 18ft., drawing-room 28ft. by 18ft., the two latter being opening on to the terrace, which forms a pleasant billiard-room 22ft. by 18ft., lounge and parlour, which slope down to Turkish baths and dressing and cooling-rooms. On the first floor there are 17 bed and sitting-rooms, four bathrooms, &c.; on the second floor 18 bedrooms, bath, &c.; and on the third floor ten bedrooms. The hotel has been furnished by Messrs. Maple and Co.

Edinburgh.—A Nelson Memorial Hall and Free Public Library are about to be built in Leith-walk, from plans by Mr. H. Ramsay Taylor, of Young-street, Edinburgh, the architect for the two other branch libraries already built in the city for the Nelson Trustees. The front entrance to Leith-walk is at the top of the hill, and towards Leith-walk are three fine arches. The two towards Leith-walk are the highest, and the Nelson Hall and the library, which are behind,

*By-Laws as to House Drainage, &c. Annotated by GERARD J. G. JENSEN, C.E., and another. London: Sanitary Publishing Company, Ltd., Fetter-lane.

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ILLUSTRATIONS.

HEREFORD MUNICIPAL BUILDINGS.—GORDON MEMORIAL HOME, NOTTINGHAM.—WAREHOUSE AT NOTTINGHAM.—THE PRIORY CHURCH, GREAT MALVERN.—ALMSHOUSE, ECCLESFIELD, YORKSHIRE.—FURNITURE SKETCHES.

Our Illustrations.

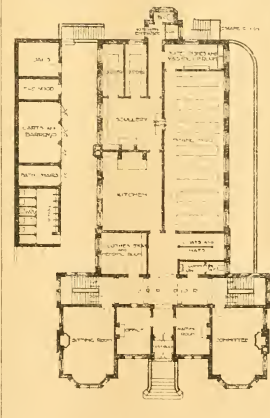
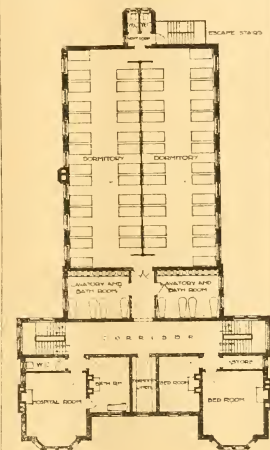
HEREFORD MUNICIPAL BUILDINGS.

Our illustrations of above are from the designs of Mr. Henry A. Cheers, of Twickenham, whose plans were placed first by the council out of six selected for final decision out of the 46 submitted in the recent public competition, and instructions have been given to proceed with the working drawings and obtain tenders forthwith. The principal front faces St. Owen-street, and will be in biscuit-coloured terracotta. A carriage-way is contrived on the north side of site, allowing visitors to the assembly-hall, receptions, &c., being set down under cover, the conveyances proceeding without turning to East-street in the rear. On the south side a footway is shown providing side entrance for caretaker, and supplementary door or exit for ratepayers from collector's office. By the arrangement of a mezzanine for surveyor's offices over the rear portion, ample room has been contrived for future extension contemplated for police-courts, &c., and without cramping or interfering with light, this essential point asked for in conditions of competition has been gained, which led very much to the final award of the council in its favour. The cost is to be about £20,000, and building operations are proposed to be commenced in the ensuing spring.

GORDON MEMORIAL HOME, NOTTINGHAM.

The Home was founded in 1885 as a memorial to General Gordon for Destitute Working Boys. In 1899 the committee, finding that the accommodation was quite inadequate, they purchased a site and invited architects to submit plans. Those prepared by Mr. Ernest R. Sutton were accepted, and it is hoped the work will be started early next year. The Home, when completed, will accommodate 104 boys. It is intended to provide at first accommodation for 72 boys. On the basement floor are arranged the large recreation and drill-room, cloakrooms, drying-rooms, day-lavatories, boot-cleaning and busday rooms. The library and writing-rooms face the street. On the ground floor are the dining-hall, with kitchen, scullery, plates, dishes, and washing-up room adjoining. The committee, waiting-room, &c., are on the south side of the principal entrance; the office, master's and matron's rooms on the north. In the yard are the day w.c. and urinals, bath chair, cart and barrow-houses, coals, &c.; in the rear of the Home is the play and drill-ground, and also a small laundry is provided comprising washhouse, ironing-room, and drying-closet. On the first floor accommodation is provided for 52 boys in two dormitories, with lavatory and bathroom adjoining. The hospital-room, with separate bath and w.c., are placed on this floor; also the master's and matron's bedrooms. On the second floor similar accommoda-

tion is provided in the dormitories and the staff bedrooms. The heating is by low-pressure hot-water pipes and radiators. Internal ventilation is procured by ventilation flues and extractors. The lavatories, bathrooms, corridors, and staircases are lined with glazed bricks; the dormitory floors are fireproof construction; the staircases



are of stone. Fire-escape staircase is provided from the dormitories. The walls externally are of red brick, with Derbyshire stone dressings. The estimated cost of the building is £5,000.

EXTENSION OF MESSRS. J. AND R. MORLEY'S PREMISES, NOTTINGHAM.

This new building completes the somewhat irregular square of Messrs. J. and R. Morley, the celebrated hosiers' extensive warehouse. With this latest addition the premises extend to a distance of some 350ft., occupying the whole of one side of the street known as Fletcher Gate from Waser Gate to Pilcher Gate, and return along Waser Gate for about 120ft., the average depth being 250ft. From these premises the several factories situated in the Midlands are controlled, and the finished goods come to be examined, stamped, packed, and forwarded to their destina-

tion. The warehouse is four stories high, exclusive of a large ancient rock altar, which was used for a beer cellar in connection with the public-house, which formerly stood at the corner of the site. This cellar is now used for the storage of yarn. In the basement are large strong rooms and stock rooms, lined with white glazed bricks. On the ground floor are the packing and examining rooms. The first floor, the counting-houses, sale-room, sample-room, manager's offices, and private office. The second floor, the making and pressing rooms; lavatory, and w.c., accommodation is provided on each floor. The walls of the principal staircase and entrance-hall are lined with faience. The facings are of red sand bricks, with Derbyshire stone dressings. The contractor is Mr. T. Barlow, of Nottingham, the plumbing and sanitary work Messrs. Humphrey and Co., the architect Mr. Ernest R. Sutton, Bromley House, Nottingham.

THE PRIORY CHURCH, GREAT MALVERN.

The Priory Church, Great Malvern, was erected (probably on the site of a former church) in about the year 1084 by the hermit Aldwin. In the middle of the 15th century the church underwent a complete restoration, and it is from that time that the present church dates, only the lower portion of the nave and the south side of the older building remaining. A Lady chapel to the east of the presbytery was also built, but no trace of this is left. The cloisters, too, are completely demolished, as also is the south transept. The church has some very fine Perpendicular windows, the great east window especially being of very nice proportions. The whole of the windows of the presbytery and its aisles, also the two windows in the north transept, are filled in with magnificent stained glass, though that in the great east window is only made up of fragments. The church is also celebrated for its encaustic tiles, which are mostly of about the same date as the rebuilding of the church, although a few of them are evidently of older date. The north porch, being in a very dilapidated condition, was taken down a short time ago and rebuilt, the original design being strictly adhered to. The tower, which rises above the central crossing, is in two stages, and is surmounted by an open battlement, with large open arches at the angles, and is generally much admired. It is in many respects of very similar design to the tower of Gloucester Cathedral, only on a smaller scale. These drawings by Mr. A. J. Pitcher have been awarded a National Silver Medal at the Royal College of Art, South Kensington.

ALMSHOUSES, ECCLESFIELD, YORKSHIRE.

The almshouses illustrated are to accommodate four widows, and will be built of local stone and Dunford slates. Mr. C. O. Nelson, A.R.I.B.A., of Holborn, is the architect.

FURNITURE SKETCHES FROM THE SALE ROOMS.

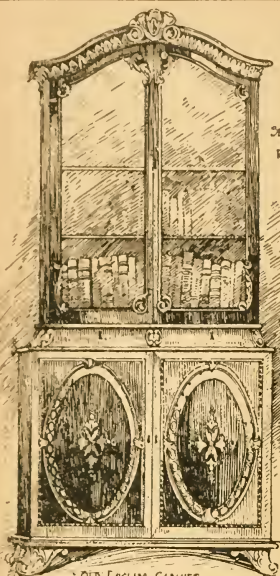
These pieces of furniture came into the sale room through the death of Lady Charles Bruce. The Old English Cabinet is of the Queen Anne period, and of a graceful design and delicate workmanship, finely carved with decoration of that period. The upper part is fitted with shelves inclosed by glazed doors, the lower portion inclosing four drawers, with oval panelled inlaid doors. The Old English Sideboard is of Spanish mahogany. It is 7ft. long, squared back, and on sweep in front; the top stands on tapered and fluted legs. In the centre is a fine Jacobean panel of festoon and vase design. The Jacobean Cabinet contains eight drawers, the front of each having shaped mouldings of various patterns, whilst the pilasters of ends are carved with a figure design, and the centre one with fruit.

A memorial erected in the Godmanchester parish church was dedicated on Thursday week. It consists of an oak carved retables with five niches, the centre one containing a crucifix, and on either side are figures representing the Virgin Mary and St. John, while the two outer ones are filled with representations of angels. The whole is gilded. There is also a rood screen.

The old organ at the cathedral-like parish church of Ottery St. Mary will shortly be removed by Messrs. Hele and Cogan builders, of Plymouth. The new instrument, in which will be incorporated the best parts of the old organ, is to be built in a divided form, so that the vista in nave and aisles is not blocked. The organ will be inclosed in two oak cases, and played by pneumatic action from the keyboards, to be placed in front of the north position of the instrument.

FURNITURE SKETCHES FROM
MESSRS ROBINSON AND FISHERS SALE ROOMS.

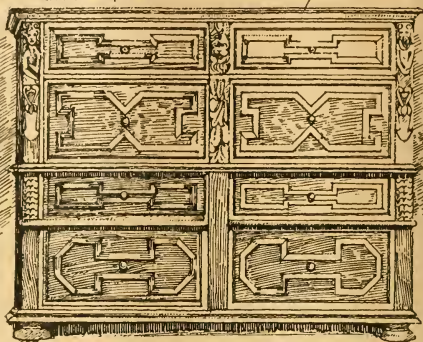
PROPERTY OF LADY BROCKE DEC^d



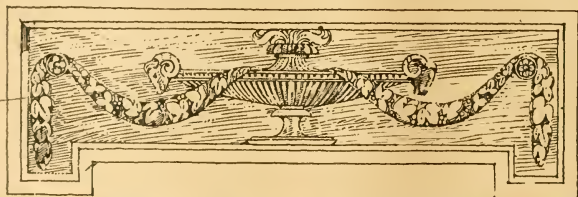
OLD ENGLISH CABINET
QUEEN ANNE PERIOD



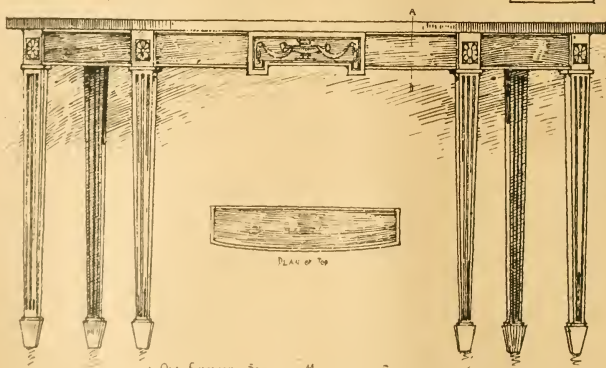
DETAIL OF CARVINGS TO MOBS



OAK JACOBESIAN CABINET



DETAIL OF
PANEL TO
SIDEBOARD



DETAIL OF
FOOT



PLAN OF TOP



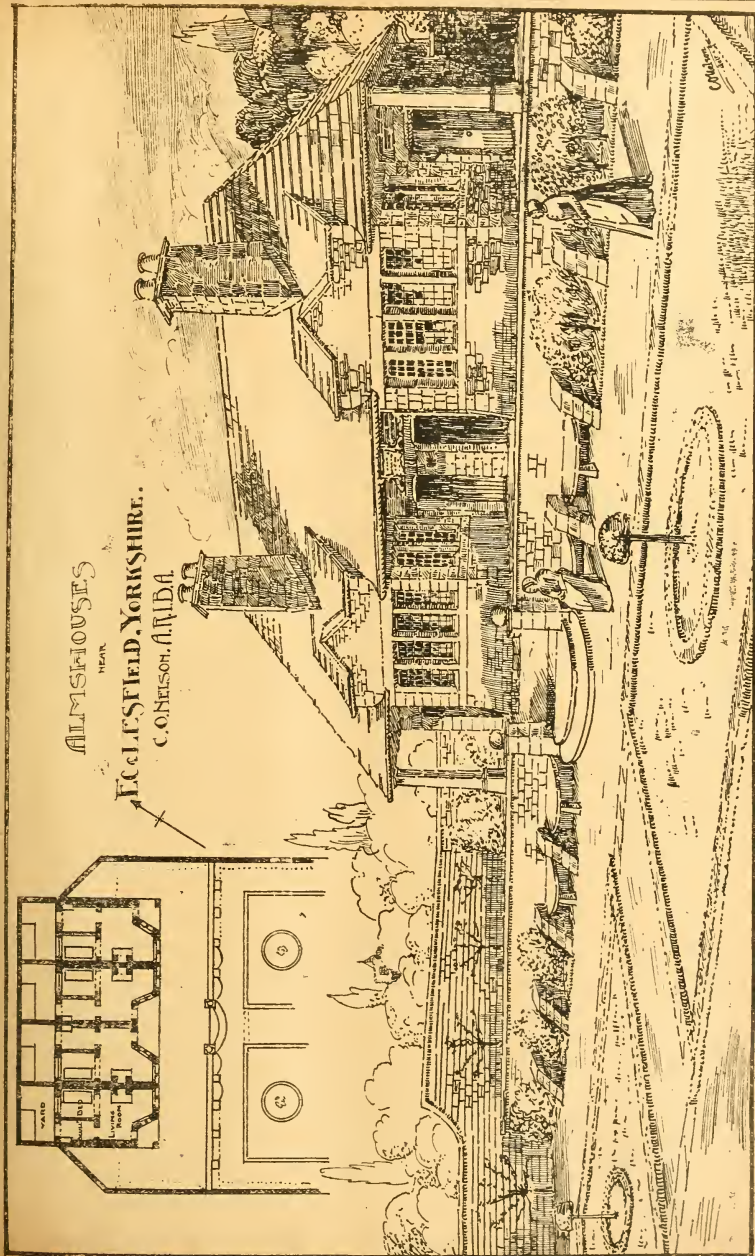
SECTION
AT
A B



DETAIL

W. J. G. 1891

OLD ENGLISH SPANISH MAHOGANY SIDEBOARD



Our Office Table.

THE report of the trustees of the National Portrait Gallery shows, as usual, that the collection is increasing by slow degrees. Twenty-seven portraits were presented, and sixteen purchased during the year, and the total number of portraits in the gallery now stands at 1,460. As the gallery has been 41 years in existence, there can be little hope, at this rate, of adequate growth. Whether it will ever approach the ideal of a national collection depends mainly upon the Treasury. At present the Trustees have only £1,200 a year for purchase, and this, as Lord Rosebery pointed out the other day, is absurdly inadequate.

THE foundations are being prepared for the new City Theatre in the Strand, which is to stand exactly opposite the old one, which will be torn down until its successor is ready for occupation. The structure should be a distinct addition to the architectural beauties of the Metropolis, and the London County Council has taken a very wise step in order to insure this. When Mr. Ernest Runtz submitted a design for the elevation of the new Gaiety, he suggested to the Improvements Committee that it should ask Mr. Norman Shaw, R.A., to assist in deciding whether the design was suitable as the Council's, be advised to approve, having regard to the extreme importance of the site, and the probable effect of the new buildings upon the architecture of other buildings to be erected in connection with the improvement. Mr. Norman Shaw readily accepted his services at the Council's request, and pains in examining into the whole matter, with the ultimate result that he made suggestions for the architectural treatment of the buildings in question, and produced a sketch design in illustration of his suggestions. Mr. Runtz at once accepted Mr. Shaw's suggestions, and proceeded to prepare a complete design, which has now been approved by the Council. We congratulate all concerned.

THE programme of the conference as to cheap dwellings, which is to be held under the auspices of the Corporation of Glasgow on September 24 and 25 next, has been issued. The subjects for discussion include the means of acquiring, at the lowest possible cost, the land necessary for the erection of cheap dwellings, the various feasible modes of construction of such dwellings, the dealing with unhealthy and congested areas, farm-out houses, the position of municipal authorities with regard to providing accommodation for the population displaced by the demolition of slum properties, and also with regard to providing the occupants of cheap dwellings with cheap means of communication between their houses and their places of employment, and the development of a housing policy involving a minimum charge on the rates. Amongst those who will introduce discussions are Councillors Gray, Buttr, and Shaw Maxwell, Dr. A. K. Chalmer, medical officer of health; Mr. Peter Fyfe, chief sanitary inspector, Glasgow; Councillor Halder, Hull; Councillor Innes, Derby; Mr. J. B. Massey, sanitary inspector, Burnley; Bailie D. M. Stevenson, Glasgow; and Mr. W. C. Menzies, manager, Glasgow Corporation City Improvements Department. The proceedings will take place in the Council Hall.

AT the quarterly meeting of the Tamworth Town Council last week, Councillor F. Aldritt, presenting the report of the Finance Committee, said that owing to the crowded state of the surveyor's duties, which he was unable to perform himself, and which would have been performed by an under-ordinator who had practically no experience, the council were involved in the loss of one hundred pounds a year. The Surveyor Mr. H. J. "Carson," Mr. Aldritt: This is not the first time I have had to protest against interruption. I have to stand here before you to do my duty to the public, and I am not only to be insulted and blackballed in the open street, but insulted in the Council Chamber by an infamous examination of "Rat" from a blackguardly councillor in this Council. I am not going to be called a blackguard in this Council. The Surveyor: Keep your seat, and be silent. The Surveyor again interrupted Mr. Aldritt, whereupon the latter inquired if he was to be permitted to ask the mayor to ask the surveyor to leave that chamber? The Mayor: I must ask him to be silent. The Surveyor: I thank you

members. After some discussion the report was adopted.

THE Free Library and Technical Instruction Committee of the Widnes Corporation, together with the Widnes Photographic Society, have organised an art exhibition, which is held in the Municipal Technical School, and was opened last Tuesday. The exhibits are scarcely so numerous as three years ago, when there was a large collection from South Kensington, but both oils, water-colours, and photographs are, on the whole, of a higher standard of merit. On the walls are canvases of Sir E. J. Poynter, P.R.A., Peter Graham, R.A., Thos. Faell, and J. Fowler, R.C.I., Edwin Nicol, R.A., Adrian Jones, and other well-known artists. In addition the members of the Widnes Photographic Society, St. Helens Photographic Society, Liverpool Amateur Photographic Society, the St. Helens Sketching Club, and Widnes artists contribute many specimens of their work. The exhibition will remain open until August 17.

THE report of the Leeds Fircely Company, Limited, for the twelve months ending June 30, 1901, says, after charging £8,226 13s. 4d. for interest on debentures to June 30, the divisible profit, including £15,625 6s. brought forward from last year, amounts to £88,367 1s. 10d. The directors have decided to divide the profit £22,367 1s. 10d. to be distributed now. The directors propose to deal with as follows:—To pay a dividend on the ordinary shares at 2½ per cent. for the six months ending June 30, 1901 (payable September 1), £10,000; and the balance dividend (second account), £12,367 1s. 10d. £22,367 1s. 10d. The volume of trade done during the year has been fully maintained, but the directors regret that the net result, owing entirely to special causes, has not been as satisfactory as they could desire.

A FURTHER chapter in the history of the Pennsylvania State Capitol has been opened by the death of the architect, who was succeeded by a new one, to be appointed by the Commissioners. The present architect, Mr. Cobb, who was selected by the Commissioners after the first competition had been set aside, and prepared plans which have been in part carried out, claims that he was defrauded of his commission, and proposed to sue. His rights in the Courts, while the Commissioners maintain that he was only employed to furnish designs, and that he has been paid for these, and has no right to further employment.

THE famous fresco by Leonardo da Vinci in the refectory of Santa Maria delle Grazie at Milan, representing the Last Supper, is to be closely examined by experts, in order to see if it is possible to retouch to the surface of the wall the layer of paint which has become partially detached, and has curled up in many places. Professor Luigi Cavenaghi, director of the Milan School of Art applied to Industry, is to make a preliminary attempt in this connection. The ground of the picture, if he succeeds the attempt will be extended. The directors of the observatory are also to study the atmospheric conditions of the refectory, and to decide, if possible, what degree of ventilation or of humidity is most favourable to the preservation of the picture. At the same time, Professor Cavenaghi will undertake a minute study of the micro-organisms which, in his opinion, are the chief cause of the deterioration of the painting. Let us hope that it will not be a case of too many doctors killing the patient.

A CORRESPONDENT of the *Daily Mail* reminds the public of the many accidents recorded lately to persons descending wells containing foul air, and gives publicity to a method for making all wells safe within easy reach of everyone. An open inverted umbrella or parasol can be used to draw up the heavy foul air from the bottom of a well by means of a rope, just as one brings up water with a bucket. The umbrella should be sent as far down as possible a number of times and brought right up to empty it of the contained contaminated air, just as one would do if using a bucket to clear the well of water.

THE annual balance-sheet of the London and County Banking Company, published elsewhere in this issue, reveals a very satisfactory state of affairs. The net profits on the year's working, it is stated, amounts to £72,880 18s. 9d., after making an allowance of £27,281 17s. 6d. for rebate on bills not due, and providing for other

liabilities. After deducting £23,000 transferred to premises account, and £100,000 carried to the credit of Consols account, £217,880 18s. 9d. is left, to which has to be added a balance of £92,077 15s. 11d. brought forward from the last account, leaving available for dividend the sum of £310,000 12s. 8d. In view of the very satisfactory condition of affairs, the Directors have declared a dividend of 10 per cent. for the half-year, together with a bonus of 1 per cent. This will require £220,000, leaving a sum of £89,957 17s. 8d. to be carried to the profit and loss account.

THE injury to the Brooklyn Bridge on July 21, of which wild reports have been telegraphed, was of an insignificant matter. About a dozen of the short suspension rods connecting one of the cables to the transverse floor-girders had their connections to the cable or the girders broken. These rods are used at the centre of the span where the distance between the cables and girders is too short for the rope suspenders employed at most places on the bridge. The connections are not of the most modern type, and gave way when the temperature strains in that part of the bridge put an unusual load on them. The so-called stiffening rods, which are used at a joint at the centre of the span where the breaks occurred.

STEELE one of the strangest vicissitudes which could befall a communion cup is to become the prize in a horse-race; yet such has been the fate of one which belonged to the Episcopal church of Clontarf, and after a disappearance of many years' duration, has at last been restored to its original purpose. The chalice, which was evidently not originally intended for sacred use. It is clear, from an inscription on the bottom of the chalice, that it was presented as a cup at the Cheltenham races in 1833, and was won by a horse there. The inscription underneath reads:—"Cheltenham, July 8, 1833. Won by Exile, five-year-old."

THE British cement manufacturers are said to be anticipating a lull in the foreign demand during at least the next six months. This view is being reflected in a weakening of prices, and there seems to be little doubt that stocks are accumulating. The incident is of interest for the sake of the light it throws upon the probable demand for structural ironwork for new projects in the near future. America itself is coming to the end of its contracts for certain descriptions of rolled steel work, with the result that there is an eagerness to pick up business abroad.

THE Tenement House Act, just passed by the United States Legislature, has been very strongly taken up by the press of the New York State. The President of the Board, Mr. Sexton, has decided that the first matters to be insisted upon are those which apply to all tenement houses, new and old, and has issued orders directing rooms not lighted and ventilated according to the very stringent requirements of the new law to be dealt with at once. The tenants' public halls to be lighted, where necessary, by putting glass panels in doors opening on them, and halls, stairs, cellars, and other public portions of tenements to be put in clean condition and kept so.

Owing to much of the stonework of Hales Owen parish church having recently decayed very badly, the church council has found it necessary to restore the exterior of the church, and it has been pronounced dangerous. At a meeting recently held, Viscount Cobham presiding, it was resolved to accept the tender of Messrs. Collins and Godfrey, of Tewkesbury, for £1,025 for the work. The whole of the work it is deemed necessary to execute will cost £1,200.

The finance committee of the Birkenhead Corporation have appointed Mr. Henry Hartley, of Liverpool, as an expert to confer with their building committee in respect of the structural condition of certain parts of the town-hall as affected by the recent fire.

A farewell dinner was given at the Holborn Restaurant on Wednesday week to Mr. George Green, C.E., and the surveyor of the Metropolitan Police, Mr. Martin-in-the-Fields, upon his leaving London to take up his new appointment as borough engineer of Wolverhampton.

LIST OF COMPETITIONS OPEN.

Edceall—Alterations to Church			The Rev. T. Houghton, Edceall Vicarage, Sheffield	Aug. 31
Penance—Laying-out Ground on Western Promenade	£21 (merged), £10 los.		T. H. Cornish, Town Clerk, Public Buildings, Penance	Sept.
Blackpool—Cricket Ground at Cemetery	£30, £15, £5.		The Borough Surveyor, Town Hall, Blackpool	" 16
Chelsea, S.W.—Public Baths, King's-road	100gs. (merged), 50gs., 30gs.		The Public Baths Committee Office, 171, King's-rd., Chelsea, S.W.	Oct. 1
Camberwell—S.E.—Baths and Washhouses, Old Kent-road				
(A. Saxon Snell, F.R.S., Assessors)	150gs., 75gs., 50gs.		The Town Clerk, Town Hall, Camberwell, S.E.	" 29
St. Peter Port, Guernsey—School (750 places)			Thomas E. G. Lee, Rector, St. Peter Port, Guernsey	" "
Walton-on-Thames—Municipal Buildings, Fire Station, &c.	£30, £20, £10 los.		P. H. Webb, F.R.C.S. Clerk, Walton-on-Thames	" "
Cardiff—Chapel, Cathedral-road (cost £2,000)			Thomas Evans, 102, Cathedral-road, Cardiff	" "

LIST OF TENDERS OPEN.

BUILDINGS.

Clyst St. Lawrence—Two Cottages and Alterations to Farm		St. John's Hospital Governing Body	C. E. Ware and Son, Architects, Gandy-street Chambers, Exeter	Aug. 10
Merrington Lane, Co. Durham—Mission Hall		Rev. E. Fenton	Stephen Wilkinson, Architect, Mosley Chambers, Newcastle	" 10
Stockton-on-Tees—Extensions to Imperial Boiler Works		W. Waterson	W. H. Linton, Architect, 18, Exchange, Stockton	" 10
Darlington—Eleven Houses, Woodlands-terrace		Royal Institution of South Wales	Frank Martin, Architect, South Eoli Chambers, Darlington	" 10
Swansea—Art Gallery, &c.		Town Council	H. C. Portsmouth, Architect, 6, Fisher-street, Swansea	" 10
Bangor—Alterations to No. 12, Dean-street		School Board	W. G. Williams, Architect, 230, High-street, Bangor, Wales	" 10
Musselburgh—Municipal Buildings		Late Robert Newton's Trustees	Henry Madern, Architect, Clarence-street, Penzance	" 10
Fall, Cornwall—Alterations to Newlyn Board School		St. John's Hospital	Edward A. Wharham, A.R.I.B.A., 39, High-st., Stockton-on-Tees	" 10
Blyth—Dismantling Black Bull		Horlake and West Kirby U.D.C.	A. H. Kyles, F.R.C.S., 20, Nicholas-st., Newcastle	" 10
Stockton-on-Tees, Devon—Two Cottages		Gillingham & Grange School Board.	C. E. Ware and Son, Architects, Gandy-street Chambers, Exeter	" 10
Letterkenny—New Ceiling, &c., Termon Chapel.		Wesleyan Chapel Trustees	M. O'Callaghan, Architect, Letterkenny	" 10
Hydnam—New School (1,250 places)		Guardians	S. Battersby, District Council, Hydnam	" 12
St. Stephen's-by-Saltash—School Premises		School Board	H. Dighton Parsons, A.R.I.B.A., 27, Chancery-lane, W.C.	" 12
Hemel Hempstead—Alterations at Workhouse		Sunderland and S. Shields Water Co.	W. H. Fordell, Sec., Burraston, St. Stephen's-by-Saltash, Cornwall	" 12
Beaulieu—School		George Heriot's Trust Governors	A. H. Smith, Architect, 10, Head Hempstead, Beaulieu	" 12
Seaham Harbour—Offices, Dwelling House, Workshop, &c.		Visiting Committee	W. J. Thompson, Architect, 63, Gray-street, Newcastle-on-Tyne	" 12
Gravesend—Converting Ledge and Destructor Buildings		T. Floyd and Co.	Wm. and T. E. Milburn, Architects, 20, Fawcett-street, Sunderland	" 12
Upper Bangor—Alterations to Lock-up Premises		Visiting Committee	Alfred Dryland, County Surveyor, Shire Hall, Hereford	" 12
Edinburgh—Converting Building into Art Classes, &c.		New Worthy Burial Board	W. G. Williams, Architect, 230, High-street, Bangor, Wales	" 12
Rochdale—Raising Chimney at Generating Station		Llandaff School Board	J. Anderson, Supt. of Works, 20, York-place, Edinburgh	" 12
Strling—Public Library		Miss Earle	S. Battersby and Duncan, Architects, South Parade, Rochdale	" 12
Killybegs—Shop and House		Fulham Guardians	Lesells and Taylor, Architects, 74, Young-street, Edinburgh	" 12
Worley—Greenhouse, &c., at Cemetery		Mydd Mawr Building Association	John McCarthy, Architect, Stranorlar, Ireland	" 12
Maidny, near Cardiff—Additions to Schools		Mrs. Irving	Alfred Dryland, County Surveyor, Shire Hall, Hereford	" 12
E. Hoar—Farmhouse and Outbuildings		W. Taylor	G. W. Lawton, Architect, 36, Albion-street, Leeds	" 13
Westhoughton—Six Houses		W. R. Moore	J. E. Halliday, Architect, 11, High-street, Cardiff	" 13
Burghill—Old Officers' Cottages		Rev. Dr. O'Doherty	W. J. Zees, The Poplars, Bellon, Doncaster	" 13
Great Marle—Additions to Station Buildings		Guardians	A. E. Suddell, Architect, Church-street, Westhoughton, Lanes	" 13
Lislabel—Church Works		Urban District Council	Alfred Dryland, County Surveyor, Shire Hall, Hereford	" 13
Walsken, Lanes—County Police Station		School Board	G. P. Milnes, Architect, Tudor-street, Walsken	" 13
Lislabel—Alterations		Health Committee	P. Downey, Fernagh Library, Lislabel	" 14
South Kensington—Superstructure of Royal College of Science		Health Committee	Henry Latte, Architect, County Offices, Preston	" 14
Lislabel—Hotel		Health Committee	P. Downey, Fernagh Library, Lislabel	" 14
Redruth—Offices and Stores		Health Committee	A. Huddart, Architect, 22, Lowther-street, Whitehaven	" 14
Northernport—Additions to Highfield House		Health Committee	Sampson Hill, Architect, Green-lane, Belruth	" 15
Whitehead—Lapland, &c., to the Library		Health Committee	John Kirk and Sons, Architects, Huddersfield	" 15
Aish, South Brent—Farmhouse		Health Committee	W. Banks, Borough Surveyor, Town Clerk, Aish	" 15
Redruth—Shop and Residence		Health Committee	T. W. Pearce, Surveyor, Stollford Modbury	" 15
Outlake—Shed and Stabling, Bar Horse Inn		Health Committee	Sampson Hill, Architect, Green-lane, Redruth	" 15
Fulham Palace-road, S.W.—Additions to Workhouse		Health Committee	Berry, Architect, 8, Queens-street, Huddersfield	" 15
Rlyth—Draining Road, Links-road Brickworks		Health Committee	A. Saxon Snell, F.R.I.B.A., 22 Southampton Edge, Chancery-l., W.C.	" 15
Handy—Twenty Houses at Pumble		Health Committee	A. Wiedle, Architect, Elyth, Northumberland	" 15
Chenilleford—Four Labourers' Cottages		Health Committee	G. P. Milnes, Architect, Tudor-street, Walsken	" 15
Enniskenil—Improvements to Gortakenly House		Health Committee	F. Whitmore, Architect, 17, Duke-street, Chelmsford	" 16
Grimsden, Redenshe, Stable, and Outbuildings, Lee Fields		Health Committee	T. Elliott, 37, Darling-street, Enniskenil	" 16
Chittlehamholt—Houses and Buildings at High Bullen Farm		Health Committee	Stephen Shaw, F.R.I.B.A., Architect, Highgate, Kendal	" 16
Longdarey—Five Houses, Hog's Folly		Health Committee	S. Dobell, Architect, Queen-street Chambers, Exeter	" 16
Spital—Additions to Children's Homes		Health Committee	E. J. Toye, Architect, Strand, London	" 16
Hanslet—Additions to Children's Homes, Rothwell Haigh		Health Committee	G. P. Gray, Architect, 3, Ivy-glace, Berwick-on-Tweed	" 16
Wroughton—Rebuilding Three Horsehoes Inn		Health Committee	W. E. Richardson, Architect, Rothwell	" 17
Yeady—Crescent, &c., Church-street		Health Committee	W. Drew and Sons, M.S.A., Architects, 28, Regent-circus, Swindon	" 17
Walton-on-Thames—Stables, Cart Sheds, Cottage, &c.		Health Committee	D. M. Jenkins, Architect, 2, Gwynn, Cardiff	" 17
Hoyleland—Alterations to Schoolhouse		Health Committee	C. J. Jenkins, A.M.I.C.E., Council Offices, Walton-on-Thames	" 17
Brimcombe—Mission House, Hyde		Health Committee	Walter J. Sykes, Architect, Horland Nether, near Barnsley	" 17
Whitechurch—School		Health Committee	The Borough Surveyor's Office, Town Hall, Luton	" 17
Pembroke Dock—Two-storied School, Myerick-street		Health Committee	R. and S. Williams, Archts., Borough Chambers, Wharnton-st., Cardiff	" 19
West Dingle—Caretage, &c., to the Library		Health Committee	G. Morgan and Son, Architect, 24, King-street, Carmarthen	" 19
Bethnal Green, E.—Addition to Bakehouse, 24, Culvert-avenue		Health Committee	Robert Wright, Port Chambers, Cardiff	" 19
Bristol—Disinfecting Station, Feeder-road		Health Committee	The Architect's Department, 18, Pall Mall East, S.W.	" 20
Coventry—E. B. E. A. Architects, 17, Queens-terrace, Aberdeen		Health Committee	H. B. Yabbison, M.I.C.E., City Engineer, 63, Queens-square, Bristol	" 20
Blyth—Electricity Works		Health Committee	Brown and Watt, Architects, 17, Queens-terrace, Aberdeen	" 20
Darfield—Eighteen Houses and Shop		Health Committee	Lacey, Clirrhugh, and Sillar, Engineers, 2, Queen Anne's-gate, S.W.	" 21
Rebstock—Lapland, &c., to the Library		Health Committee	A. B. Linton, Architect, Carlisle Villa, Wombwell	" 21
Port—Extensions to Wyndham Constitutional Club		Health Committee	G. P. Gray, Architect, 3, Ivy-glace, Berwick-on-Tweed	" 21
London—Alterations to Queensberry Road School		Health Committee	W. H. Childs, 69, Cymmer-road, Port, Wales	" 21
Stratford-upon-Avon—Porter's Lodge, &c., at Hospital		Health Committee	J. H. Beckett, Architect, Stafford-street, Longdon, Staffs.	" 22
Avon—Pavilion at Isolation Hospital		Health Committee	W. B. Rawcliffe and A. J. Seward, Architects, Fishergate, Preston	" 22
Totting, S.W.—Two Cottage Homes, Church-lane		Health Committee	Cecil A. Sharp, Archt., 11, Old Queen's-gate, Anne's Gate, S.E.	" 22
Luton—Fire Station, &c., Church-street		Health Committee	The Borough Surveyor's Office, Town Hall, Luton	" 23
Rotherhithe, S.E.—Block of Dwellings, Swan-lane		Health Committee	The Architect's Department, 18, Pall Mall East, S.W.	" 23
Wales—Three Workmen's Dwellings		Health Committee	The Borough Surveyor's Office, Town Hall, Luton	" 24
Nelson—Electric Lanes to Station, Charles-street		Health Committee	W. J. Gibson, Architect, 4, Grosvenor-lane, W.C.	" 24
Walsall—Municipal Offices and Town Hall, Lichfield-street		Health Committee	J. Williams, Clerk, J. High-street, Cardiff	" 24
Mytholago—Schoolroom and House		Health Committee	Robert Shaw, A.M.I.C.E., City Engineer, 11, Bedford-st., London	" 26
Bird—Hospital		Health Committee	Menahem Lee, City Engineer, Tower Hill, Birkbeck	" 27
Town—Cattle Market		Health Committee	C. Broadbridge, A.M.I.C.E., Borough Eng., Town Hall, Birkbeck	" 27
Birkenhead—Mortuary, Livingstone-street		Health Committee	Newman and Newman, Architects, 31, Tooley-st., London Bridge, S.E.	" 29
Rustington, Sussex—Residence Homes		Health Committee	John Bowen, A.M.I.C.E., Borough Engineer, Town Hall, Reading	" 29
Leavesden—Additions to Asylum Laundry		Health Committee	T. M. Lockwood and Sons, Architects, Fawcett-street, Chester	" 30
London—Ladies' Swimming Bath		Health Committee	J. Creswell, County Architect, Mould, Newcastle-on-Tyne	" 31
Donagh—Additions to Station, Charles-street		Health Committee	A. J. Wood, Architect, 22, Surrey-st., London	" 31
Whitley—Police Station and Petty Sessional Court		Health Committee	R. E. Bowen, Architect, 22, Surrey-st., London	" 31
Middleton—Ladies' Asylum Extensions		Health Committee	G. E. T. Laurence, Architect, 22, Buckingham-st., Adelphi, W.C.	" 31
Boston, Lanes—Police Station, &c., Norfolk-street		Health Committee	J. Owen, Architect, Menai Bridge	" 31
Emild Lock—Junior Mixed School, Chesterfield-road		Health Committee	The Surveyor's Department, Town Hall, Paddington, W.	" 31
Sutton, Leeds—City Hospital Extension		Health Committee	M. Walker, J. Sundhurst-terrace, Leeds, Horsforth	" 31
Belyhead—County School		Health Committee	C. P. Ayres, Architect, Bursale, Watford	" 31
Paddington, W.—Mortuary Buildings and Chapel		Health Committee	J. S. Gulliford, Pontliff, Wales	" 31
Measham—Residence		Health Committee	The Nunnery Colliery Co., Ltd., Corn Exchange, Sheffield	" 31
Reneworth—Additions to Isolation Hospital		Health Committee	T. Holliday Richardson, Architect, Hemsworth, near Wakefield	" 31
New Wootley—Twelve Houses and Shops, Tong-road		Health Committee	J. Maude, Building, Tong-road, New Wootley, Leeds	" 31
Leeds—Green, Englefield, 11, Queen Victoria-street, Leeds		Health Committee	W. G. Williams, Architect, 230, High-street, Bangor, Wales	" 31
Reneworth—Working-Men's Club		Health Committee	W. E. Richardson, Architect, Rothwell, Leeds	" 31
Wolver—Three Cottages, New-street		Health Committee	S. East-street, Andover	" 31
Walsall—Five-Etomed House		Health Committee	P. Puleston, 56, Upper Parliament-street, Nottingham	" 31

BUILDINGS

Stirling—Public Library	Public Library Committee	Lesells and Taylor, Architects, 74, Young-street, Edinburgh
Liverpool—One Hundred Cottages	Public Library Committee	Milnes and Suberland, Ltd., 63, South John-street, Liverpool
Wallingford—Additions to Grammar Schools	Public Library Committee	S. R. Stevenson, Architect, 29, Barnard-street, Nottingham
Staines—Schools	School Board	Lav and Allen, Architects, Deane House, Arundel-st., Strand, W.C.
Gloucester—Addition to Exeter Hotel	School Board	Arthur Hill, E.E., M.B.E., 22, George-street, Cork
Penryn—House	R. and P. Hartley	The Naval Gallery Co., Ltd., 10, Fennyng-street, Plymouth
Dulton—Rebuilding Golden Hall	Earl of Wilton's Trustees	Settle and Farmer, Architects, Dulton
Port Barton, Devon—Additions to Farnhouse	Public Benefit Box Co.	Ellis, Son, and Bowden, Surveyors, Exeter
Morby—Cottage—Vicarage	Grangemouth Parish School Board	G. Moxham, Architect, 28, Cadogan-street, Chelsea
Radcliffe, Lancs.—Houses and Shops	J. E. Lyne	James Sellers and Son, Architects, 1 Union Chambers, Bury, Lancs.
Hungateham, Wilt.—Vicarage	Malton Gas Co.	Hans E. Price, Architect, Wood-super-Mare
Leam, N. H.—Block of Semi-detached Cottages	James Storror	Sylvanus Trevel, Architect, Truro
Bulwell—Church Institute, Robinson's Hall	Carlisle South-End Co-op. Soc., Ltd.	G. Howard, Reg. Health, Worplesden, near Guildford
Frederick, Mon.—Renovating Premises, Bridge-street	Late W. H. Williams' Executors	Alexander Gould, Architect, Vicar-street, Falkirk
Thompson—Administrative Block Extension	Guardians	The North Walbottle Coal Co., Ltd., A. Exchange Bldgs., Newcastle
		Freeman, Son, and Gaskell, Architects, Carr-lane, Hull
		Jackson and Fox, Architects, 29, Fennyng-street, Plymouth
		Henry Tobey, Engineer, Castlegate, Malton, Yorks.
		J. T. Franklin, Architect, 40, Bridge-street, Rugby
		C. H. Davies, and Sons, Architects, Newcastle, Chester
		Arthur J. Lacey, Architect, 6 Upper King-street, Norwich
		T. Taylor Scott, F.R.I.B.A., 43, Louth-street, Carlisle
		Leeming & Leeming, F.F.R.I.B.A., Victoria-street, Victoria, S.W.
		W. V. Betts, Architect, Bank Offices, Old Bedford
		B. J. Francis, Architect, Abernethy
		T. Taylor Scott, F.R.I.B.A., Architect, 43, Louth-street, Carlisle

ELECTRICAL PLANT.

Wigan—Motors and Starters One Year	Corporation	H. Collinge Bishop, Electrical Engineer, Bradford-place, Wigan	Aug 10
Dunstable—Cables, &c.	Corporation	C. A. I. Frothingham, Elec. Engr., Gray Friar-road, Dunstable	17
Manchester—Electrical Accessories, Machine Tools, &c.	Tramways Committee	J. H. M. Eley, Engr. Man., Tramways Dept., 53, Piccadilly, Manchester	17
Brighton—Electric Light Installation	Guardians	P. Coste, Electrical Engineer, 10, Fennyng-street, Plymouth	17
Wokingham—Electric Light Plant	Corporation	H. G. Sturges, Town Clerk, Town Clerk's Office, Wokingham	22
Worcester—Electric Light	Corporation	C. J. Sutherland, City Elec. Engineer, Guildhall, Worcester	23
Derbyshire—Electric Lighting of Asylum	Croydon Town Council	R. W. Davies, Asylum Clerk, Bridgton	26
Warrington—Wiring for Elec. Light Installation at Asylum	Municipality	The Borough Engineer's Office, Town Hall, Croydon	26
Amsterdam—Electrical Tramcars, &c.	District Council	The Director, Municipal Tramways, Nieuwe Achtergracht, No. 164, Amsterdam	Sept 2
Willesden, N.W.—Equipment of Electricity Works	District Council	E. T. Rutven-Murray, Elec. Engineer, Dyne-road, Kilburn, N.W.	1

ENGINEERING.

Leigh, Lancs.—Coke Elevator	Gas Committee	J. Foster, Engineer, Gasworks, Leigh, Lancashire	Aug 10
Killeen, Ireland—Waterworks, &c.	Cork Rural District Council	John Cotter, Cork, Cork	10
Worcester—House	Corporation	Town Clerk, M.C.E., 28, Northumberland-avenue, W.C.	10
Knareborough—Pump at Waterworks	Urban District Council	S. Turner, Surveyor, Knareborough	10
Shipston-on-Stour—Main Drainage and Water Supply	Chipping Campden R.D.C.	N. Lacey, A.M.I.C.E., 16, George-street, Westminster	10
Tulstall—Settling Tanks	Rural District Council	R. and J. Barrett, Sons, Folds-street, Bolton	10
Stanford-le-Hope—Pumping Machinery	Orsett Rural District Council	R. F. Grafton, M.I.C.E., 23, Northumberland-avenue, W.C.	10
Aberavon—Stone Arch Bridge to carry Road	Rural District Council	John Gill, Surveyor, 4, Broom-road, Aberavon	10
Farnworth—Can-Side Traverser	Urban District Council	W. G. Grafton, M.I.C.E., 28, Northumberland-avenue, W.C.	10
Nottingham—Pipelaying 5 miles	Water Committee	The Gen. Manager, Water Dept., St. Peter's, Church Side, Nottingham	12
Tyldesley—Steel Tank for Gasholder	Town Council	The Engineer, Gasworks, Tyldesley	12
Stanford-le-Hope—Sewage-Derived Works	Orsett Rural District Council	W. G. Grafton, M.I.C.E., 28, Northumberland-avenue, W.C.	12
Whitechapel—Rebuilding Steel Bridge over the Thames	Urban District Council	J. Morris and Sons, Architects, 136, Friar-street, Reading	13
Aberdeen—Tunnel, Sewers, &c.	Corporation	W. Dyck, M.I.C.E., 33, Queen-street, Town House, Aberdeen	13
Weymouth—Main Sewerage 15 miles	Rural District Council	T. H. Hildred, A.M.I.C.E., 28, Northumberland-avenue, W.C.	13
Christiana—Six Bridges 135 tons	Norwegian Railways Administration	G. Boyd, C.E., 33, Queen-street, Whitehaven	14
Farnley, Devon—Water Supply Works	S. German Rural District Council	The Railway Director's Office, Jermin-street, London	14
Burnley—Widening Mill Bridge over Canal	Corporation	C. J. Sutherland, City Elec. Engineer, Guildhall, Worcester	14
Worleston—Rebuilding Bookery Quay over Canal	Corporation	F. E. Ball, County Engineer and Manager, Town Hall, Ipswich	14
Ipswich—New Service Reservoir (4,000,000 gal.)	Waterworks Committee	Herbert W. Longdon, Surveyor, Town Hall, Ankerly	17
Penge, S.E.—Fire Escape, &c.	Urban District Council	L. Lander, Clerk, Engineer and Manager, Town Hall, Ipswich	17
Singapore—Portable Electric Pump, 1,000 yards dist. gauge	New South Wales District Council	Harold Roberts, Engineer, 21, Bedford-st., London	19
Wigan—Stoking Machinery	Gas Committee	Harold Roberts, Town Clerk, Wigan	19
Wigan—Four 80-gallon Boiling-Tanks at Asylum	8 Lancashire Electric Traction Co.	The Resident Medical Superintendent, District Asylum, Sligo	19
Liverpool—Widening Main Sewer 20 miles	East Indian Railway Co.	S. G. Waller and Mortimer, 28, Great George-st., S.W.	19
London, E.C.—Goods Engines and Tenders	Newmarket Rural District Council	C. W. Young, Secretary, Nicholas-lane, E.C.	21
Stetchworth—Water Supply	Metropolitan Asylums Board	F. S. Courtney, Engineer, Broad Sanctuary Chambers, Westminster	21
Tenny Standford—Sewerage and Sewage-Disposal Works	Urban District Council	T. Duncombe Mann, Clerk, Embankment, E.C.	28
Dartford—Three Lancashire Boilers, &c., Joyce Green Hospital	Corporation	W. H. Isador, C.E., Engineer, Albion Chambers, Nottingham	28
Richmanworth—Sewerage and Sewage-Disposal Works	Urban District Council	J. Hammond, M.I.C.E., 64, Victoria-street, S.W.	28
Bournemouth—Boilers, Feed Pumps, &c.	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Embankment, E.C.	29
Long Beach, near Dartford—Repairing Dolphins	Urban District Council	W. C. H. Watney, Engineer, 9, Queen-street-place, E.C.	29
Dord—Tramway 11 miles	Electric Lighting Committee	R. Hammond, M.I.C.E., 64, Victoria-street, S.W.	3
Middleborough—Mechanical Coal-Handling Plant	Electric Lighting Committee	W. J. Burden, Chief Engineer, City of Havana	5
Manfield—Refuse Destructor	Danish Ministry for Public Works	Statens anlægsvesen Kontor, Revientowske 10, Copenhagen	Oct 1
Havana—Sewerage System, &c.	Danish Ministry for Public Works	Statens anlægsvesen Kontor, Revientowske 10, Copenhagen	1
Copenhagen—Bridge	Corporation	Food, Gainsford, Secretary, Culcutta	1
Halsund—Bridge over the Fjord of Mariger	New South Wales Government	The Asst. General Secy., Victoria-street, S.W.	Feb 28
Calcutta—Two Locomotives			
Bayly, New South Wales—Harbour Bridge			

FENCING AND WALLS.

Romsey—Boundary Walls and Entrance Gates at Cemetery	Joint Burial Board	James Jenner, Architect, Romsey, Hants	Aug 13
Bridgeford—Wooden Fencing	Rochdale Corporation	S. S. Platt, Borough Surveyor, Town Hall, Rochdale	13
Hackney, N.E.—Wrought-Iron Fencing, &c., 24 yards	Borough Council	N. Scrogie, M.I.C.E., Borough Engr., Town Hall, Mare-st., Hackney, N.E.	16
Farnley—Vest and Entrance to 20-sided	Urban District Council	E. J. Toy, Architect, Strand, London	16
Newtownstewart—Cemetery Walls and Gates	Rev. W. T. O'Doherty, P.P.		

FURNITURE AND FITTINGS.

Public—Office Furniture for Public Buildings	Commissioners of Public Works	H. Williams, Secretary, Office of Public Works, Dublin	Aug 20
London—Laboratory Fittings	School Board	J. H. Beckett, Architect, Stafford-street, Longton, Staffs.	22
Downpatrick—Furniture and Fittings, County Council Offices		Robert MacIver, Secretary, Court House, Downpatrick	

PAINTING.

Gillies—Eight Schools	School Board	James and Morgan, Architects, Charles-street Chambers, Cardiff	Aug 10
Museburgh—Municipal Buildings	Town Council	Lytle and Constable, 3, Hill-street, Edinburgh	10
Enfield—Two Cottages, Sharn Green-lane	Urban District Council	James Clarke, Clerk, Union Offices, Preston	12
Enfield—Workhouse Infirmary	Mutford and Loughland Guardians	Frank Pickett, Clerk, 18, London-road, Lowestoft	12
Bonwell—School	School Board	F. W. Thompson, Architect, 10, Victoria-street, Newcastle-on-Tyne	12
Morley—Working-Men's Club and Institute	Guardians	Jo. Asquith, Secretary, Morley, Yorks	12
Fulwood—Workhouse and Hospital Buildings	Sanitary Committee	James Clarke, Union Offices, Preston	12
Manchester—14 Infirmary and Lavatories	George Heriot's Trust Governors	The City Surveyor, 10, Fennyng-street, Plymouth	12
Edinburgh—Art House, &c.	Corporation	J. Anderson, Secy. of Works, 20, York-place, Edinburgh	12
Marborough—Edwards Asylum	Guardians	John T. Brick, Acting Clerk, Asylum, Marborough, Ireland	13
Albans—Public Library	Guardians	H. Debenham, Town Clerk, 8, Bridge-street, London	13
Newham—Workhouse	Guardians	H. Curtis Carr, 10, North-street, Lewes	13
Norwich—Bridg-ford House	W. Taylor Committee	John K. and Sons, Architects, Huddersfield	13
Ingilston—Bridg-ford, &c., Low Fields	Kinrossville County Council	Stephen Shaw, F.R.I.B.A., 2, High-street, Kendal	16
Guildford—Workhouse Infirmary Buildings	Shed Road	W. S. V. Culmer, Clerk, Commercial-road, Guildford	16
Stretton, N. H.—Schools and Schoolhouses	T. Wilkinson	Brown and Watt, Architects, 17, Union-street, Aberdeen	16
Dartford—Eighteen Houses and Shop	Electricity and Tramways Committee	A. B. Linford, Architect, Carlton Villa, Wombwell	21
Wigan—Electric Light Station	General Purposes Committee	B. Ball, A.M.I.C.E., Borough Engineer, Town Hall, Morley	21
Morley—Cemetery		W. E. Fulman, A.M.I.C.E., Borough Engineer, Town Hall, Morley	26
Morley—Eight Houses, Fountain-street		D. Pearson and Ainsworth, 14, Britania-road, Morley	26
Darlington—Whorlton Road		The Rev. Canon Headlam, Whorlton Hall, Darlington	

PLUMBING AND GLAZING.

Swadlow—Plumbing Work at Laid at Gasworks	Urban District Council	Thomas Hill, A.M.I.C.E., Engineer, Swadlowton	Aug 10
Northing—Public Library	Corporation	Lesells and Taylor, Architects, 74, Young-street, Edinburgh	12
Porthmouth—Plumbing Work	Corporation	Alex. Heddall, Town Clerk, Town Hall, Porthmouth	21
Reading—Public School	Grangemouth Parish School Board	A. Gould, Architect, Vicar-street, Falkirk	21

BOWEN.—For additional county asylum, Mr. Sturges Trevel, architect.

Walsingham Bros., Plymouth	£121,687	0	0
Shilland and Sons, J., Ray St. Elm- mounds	111,176	0	0
King, W., and Sons, Westminster	102,240	0	0
Bridg, C., Exeter	90,856	0	0
Rothwell, L., Birmingham	161,291	0	0
Simons, B. L., Finsbury	23,165	0	0
White, J. H., and Co., Watney, Brompton	91,200	0	0
Patrick, J., and M., and Co., Walsingham	91,000	0	0
Krause, A., and Son, Berlin	92,285	0	0
John, A. H., Finsbury	92,108	0	0
Wilkins, R., and Sons, Oxford	90,856	0	0
Edwards, W. F., Ipswich	90,668	0	0
Trevel, S., Ipswich	88,296	0	0
Patrick Bros., Plymouth accepted	87,979	0	0

Box, E.—For sanitary and drainage works at Marlborough-road, for the London School Board.

Roberts, L. H., and Son	£1,097	0	0
Lawrence, E., and Son	2,983	0	0
Johnson and Co.	2,916	0	0
Kilgoback, C. W., and Co.	2,891	0	0
Williams, G. S. S., and Son	2,891	0	0
Stevens Bros.	2,711	0	0
Baker, J. T., Bow-road accepted	2,281	0	0

BRIDGWAY, S.E.—For removing and re-erecting brick buildings from the Bowley-road site, Putney Bridge-road, to the town-hall ground site, Brickley, for the London School Board.

Rosell, D., and Co.	£1,763	10	6
Conways, F.	1,393	0	0
Leather, C., and Sons	1,437	0	0
Hawkins, H. J., and Co.	1,415	10	0
Milton, J., and Co.	1,399	15	8
Hunter, J., and W. T.	1,283	0	0
Smith, F., and Co.	1,225	0	0
Harlow, W., South Bermondsey*	1,155	0	0

* Accepted.

CULVER, C.—For heating works at Marlborough-road, for the London School Board.

Cannon, W. G., and Sons	£595	0	0
Wippell Bros. and Row	973	10	0
May, J., and F.	880	0	0
Williams, J., and Sons, Ltd.	889	0	0
Davis, G.	840	0	0
Webster and Waters, Ltd.	783	0	0
Bridley, G., and Co.	700	0	0
Brightside Foundry and Engineering Co., Ltd., Victoria, S.W.*	680	0	0

* Accepted.

CULVER, S.W.—For forming physical laboratory, bath-house, &c., at Ashlammham School, Upercare-road, for the London School Board.

Hale, W. R., and A.	£327	0	0
Maidwell Bros., Ltd.	321	0	0
Edwards Bros.	318	0	0
Hammill, W.	301	0	0
Tucker, E. F., and Co.	222	0	0
General Builders, Ltd., Wharf-road, Notting Hill accepted	213	0	0

CULVER, S.W.—For sanitary and drainage works at Ashlammham School, for the London School Board.

Lodges, L. H., and R.	£4,098	0	0
Stevens Bros.	2,888	0	0
Beebe, R. P.	2,863	19	0
Wallerst, J., and Sons	2,851	0	0
Kilgoback, C. W., and Co.	2,731	0	0
Pattee, J.	2,698	0	0
Ashby and Hunter	2,623	0	0
Williams, G. S. S., and Sons	2,592	0	0
Lawrence, E., and Son, Wharf- road, S.W. accepted	2,398	0	0

DE TOWN.—For replacing iron stays of sewage delivery tanks at the Bedford pumping-station, for the London County Council.

Mills and Knight	£393	0	0
Fraser, J., and Son	212	10	0
Fidler, Son, & Farnall accepted	128	0	0

ELTHAM PARK, S.E.—For removing and re-erecting iron buildings from the Eltham Park site, Gosport Oak, to Orange Hill-road site, Eltham Park, for the London School Board.

Bowell, D., and Co.	£1,690	0	6
Cox, C.	1,549	0	0
Leather, C., and Sons	1,472	0	0
Hawkins, T. J., and Co.	1,421	10	0
Milton, J., and Co.	1,400	0	0
Hunter, J., and W. T.	1,285	0	0
Smith, F., and Co.	1,170	0	0
Harlow, W., South Bermondsey*	1,100	0	0

* Accepted.

GREENWICH.—For sanitary and drainage works at Culver-road School, for the London School Board.

Falkner, J. W., and Sons	£3,697	0	0
Lenny, H.	3,363	0	0
Darker, G.	3,348	0	0
Kirk and Bandall	3,370	0	0
Appleby, J.	3,214	0	0
Bowyer, J., and C.	3,157	0	0
Proctor, E.	3,160	0	0
Johnson & Co., Southwark Bridge- road accepted	3,147	0	0

FOREST HILL, S.E.—For fencing-in site at Kilmar-
road, for the London School Board.

Patrick, J., and W.	£249	0	0
Hawkins, T. J., and Co.	235	0	0
Hunter, J., and W. T.	230	0	0
Milton, J., and Co.	197	10	6
Harlow, W.	178	0	0
Bush, G., New Eltham accepted	165	0	0

FULHAM, S.W.—For fencing-in site at Townsend-road,
for the London School Board.

Humphreys, Ltd.	£271	0	0
Hunter, J., and W. T.	195	0	0
Crofts, T.	192	0	0
Hawkins, T. J., and Co.	191	0	0
Hennam, W.	183	0	0
Milton, J., and Co., Denmark-road, Camberwell accepted	160	0	0

HAYESHEAD, N.W.—For alterations to St. Stephen's
National School, Worsley-road, for the London School
Board.

Neal, G.	£171	0	0
Antill, W., and Co.	423	0	0
Marchant and Hirst	423	0	0
Williams, G. S. S., and Son	374	0	0
Stevens Bros., Young Park, N.*	311	0	0

* Accepted.

HAYESHEAD, S.W.—For the erection of a special
school, domestic economy school, and school-keeper's house,
in connection with the Hayeshead Hill School, St. Paul's,
for the London School Board.

Gough, E., and Co.	£8,890	0	0
Wall, H., and Co.	8,608	0	0
Simpson, J., and Son	8,301	0	0
Putnam and Fotheringham, Ltd.	8,287	0	0
Allen, J., and Sons, Ltd.	8,288	0	0
McCrackin and Sons	8,534	0	0
Leslie and Co., Ltd.	8,510	0	0
Cox, C.	8,316	0	0
Patrick, J., and M.	8,330	0	0
Lawrence, E., and Son	8,206	0	0
Treasure and Son, Catmonham-road, Halloway accepted	8,128	0	0

HELINGTON.—For re-hanging sashes in old portion of
Blundell-street School, for the London School Board.

Deering, C. and Son	£246	0	0
Stevens Bros.	223	0	0
Hunnings, C. and W.	221	17	6
Williams, G. S. S., and Son	199	19	0
Harris, F. W.	169	0	0
Thompson and Beveridge, Albany- street, W. (accepted)	153	0	0

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THE BUILDING NEWS

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THE SCALE OF BUILDINGS.

VERY few writers on architecture have said anything very definite on what is usually called scale, by which we mean the sense of size or dimensions of any work. The word as derived from the Latin *scala*, a ladder, or a series of steps or equal distances, implies a kind of measure for the eye by which it may judge the dimensions of any object. Magnitude as a sensuous quality has been treated by some as implying sublimity; thus Alison speaks of magnitude in height as expressing elevation and magnanimity; in depth, danger and terror; in length, vastness and infinity; and in breadth, stability; and from the strength and durability of the art of building he calls it the sublimest of the mechanical arts. Ruskin dwells on the sublime in architecture in his "Seven Lamps," but he says the apprehension of the size of natural objects, as well as of buildings depends more on "fortunate excitement of the imagination than on measurements by the eye,"—a theory which agrees very much with that of Alison's. It is rather of magnitude as determinable by comparison with other objects or by the eye that we here speak, and of the value which the architect can make of it if he so desires. Proportion as a subject of considerable value would lead us too far. Much abuse has been made of ratios. Even Vitruvius and his followers imagined that the reason why a certain height and breadth was pleasing in a window or room was because two strings of beads, one thicker and tension, and of lengths having a similar ratio, yielded concordant notes. These theories are very ingenious, but they are not practical. What we mean by scale may be defined as the relation of the size of a building to a fixed unit. The smaller the unit, the greater the apparent size of the building, and *vice versa*. It is, in fact, the mode by which the eye estimates distances, lengths, and heights; and it is in this sense we use it.

We say a building is wanting in scale when it is composed of parts not well proportioned to each other. For instance, on the first-floor story we may see windows or details that are much too large or coarse for the second floor or top floor. The window openings are of very different sizes, and the details are coarse and big in one part, and small and delicate in another. But in a more correct way the want of scale implies the want of some unit by which parts can be measured to the eye. The word is certainly used in many rather vague senses. Numerous examples of buildings lacking this quality are to be noticed in London. Sometimes it is an edifice covered with small fluted parts and detail. In another case a facade consists of a few big features that are not in proportion or in pleasing gradation to the rest of the building.

A building may be said to want scale when there is nothing to compare its proportions with, no standard of height to which we can refer the parts of the building. Thus a large structure of a single order, like the British Museum, may be said to lack scale compared with other buildings divided into stories like those which surround it, and to some extent give it a scale. The best standard of height is that of the human figure. Thus a man or woman on the steps of the portico of the British Museum immediately supplies a scale to the eye, and we instantly perceive the height of the colonnade and its comparative length. But the human figure is not always

seen in relation to a building, and then it is difficult for the eye to estimate the size or dimensions of a building as when it stands in an isolated position. Take any large edifice in an open space, a long way from other buildings—say, St. George's Hall, Liverpool, or even such a building as Westminster Abbey, or even St. Paul's. The first edifice is a good illustration. It stands in a large open space; but few people viewing it from a distance would believe that its dimensions are over 400ft. in length, and 140ft. in width, or that its grand portico of sixteen Corinthian columns flanking the great hall is of the height, including the entablature, of over 50ft. Unless the figures of people are near the structure, its size and grandeur are mistaken. There is no scale of parts to which the eye can refer for assistance. Westminster Abbey is never adjoining buildings, and it has one help which St. George's Hall has not—it has a church close by of ordinary size which gives some importance to the Abbey, while it looks diminutive itself under the shadow of the large church.

Very few people can at first sight estimate rightly the size of St. Paul's when seen from Ludgate Hill, and we know St. Peter's at Rome, its prototype, is exceedingly disappointing to the visitor who people it the first time because of its want of a true scale. To judge of real size what is wanted is some means of comparison; but the eye cannot always discover one, or the mind grasp size, unless it has some recognised standard like the height of a man or the story of a house, and this is why buildings of single orders are misleading. Most people imagine the Bank of England to be a low, single-story building; but in reality it is much higher than is thought. The fact is, a standard unit or module of proportion is necessary, and no feature is more useful than the doorway, when it is proportioned to a man's height, and so naturally proportionally high, which it often is in a large edifice, as in most of those in the west fronts of our cathedrals. The great west door of St. Paul's is in this way misleading as a standard. With large buildings there is a disposition to make every feature large in proportion—a fact seen in the details and sculpture of St. Peter's at Rome, that quite misrepresents the actual size of the interior. In designing a large structure it is excusable to make everything in proportion to it. If it is an order of columns or pilasters, its mouldings and base must be governed by the recognised rule of proportion, and the capital also; so it is natural that any mouldings or sculpture with which it is adorned should be also on the same scale; but it is, nevertheless, unfortunate that by adopting such proportions the vast bulk of the edifice itself is not realised. It would certainly not be right to reduce the height of moulded base and other moulded parts to a small dimension, as the whole proportions would be thereby upset; but what the architect might do is to reduce the size of the mouldings, say of the base members, by adding extra members, so that the eye may not be shocked by their apparent coarseness; and this can be done by subdividing the mouldings by introducing fillets and small members near the eye. We here allude chiefly to the base of a colossal order of pilasters which may be seen near the eye. Subordinate members afford a scale to the eye of some value. If the reader has followed us he will see that in preserving the proportions of a great order or a great building the eye loses the actual size of the parts at a little distance away. It is to supply it with some kind of scale or fixed unit by which to estimate the magnitude, that the architect should endeavour to introduce smaller detail and finer ornament in those positions that are nearest the eye. He can do so by various devices—by a row of small dentils in a cornice, by using fine enrichments in the enriched mouldings of panels,

by bands of fine ornament. All this can be done without reducing the whole width or collective size of the mouldings. We know this is rather a moot point, whether, in short, the general proportions of a large building are to be preserved at the cost of overpowering the eye, or the general proportions made to agree with the mass. The question concerns chiefly those designs in which one large order is used. The architect happily is not now tied to Orders, and he can use two or more, so that the eye need not be shocked by coarse or heavy details.

It may be argued that every design should have its figures of a module or unit, that may be determined by the rule of proportion—as A is to B, so is C to D; or as the height of building A is to that of B, so should the size of any of the features of B be to those of A. In this way every building would have its stories, windows, doors, &c., proportioned to its size. Thus, if a building of 50ft. in height has a window 8ft. in height, a building 100ft. in height would have one of double the height. But such an increase of height would not be satisfactory, and the big buildings would lose their scale. It would be better to adopt a smaller height in proportion, and it is to find this proportion in every case that requires judgment. As a matter of fact, the architect adopts a unit that is agreeable. In a large building he adopts a height of story or a size of window that appears suitable to give a good proportion of room; he divides the height of his facade into two, three, or more orders, which help to give scale. We cannot adopt a fixed unit for buildings of all sizes, say a height of story, or window, or doorway, because if we did our large buildings would have stories and windows no larger than the small ones, and all sense of proportion of our rooms would be lost. So that, in short, it is good proportion that is the main thing to consider, not a fixed scale-unit. Thus in a large public building or block of offices we have to adopt a unit for the height of our stories that will be agreeable internally as well as externally, and this may be double or treble the height of a story to an ordinary house. To obtain a sense of scale we can resort to minor details: the joints of masonry, subdivision of window area and ornament, so that we may say the unit varies within limits according to the class of building and its size. In a large hotel like the Cecil, a window scale has to be adopted that will give good proportion to a number of small rooms, and the consequence is a number of small stories which give a scale and add immensely to the apparent height and size of the hotel. To add dignity, the architect may connect two or more stories by an order of columns or pilasters, as is done in the centre and in the wings. Mr. E. W. Mountford, in his design for the new Technical School and Museum, Liverpool, has managed to dignify the upper or third story by the adoption of coupled columns between the museum windows, thus giving emphasis to this floor. The hotel and residential type, by the window unit, and therefore a certain fitness results if there is no attempt to unite the stories by the use of columnar ordinances. Even such a use of columns as that made by Mr. H. G. Clifford in his design for the Glasgow Royal Infirmary is in this way satisfactory, by giving an importance to certain parts of the design. Smaller in the scale of parts we especially notice in the buildings designed for flats, as in the Rowton Houses and other residential buildings in London. In these instances of multiplied stories the repeated unit becomes monotonous, for we get a building of several stories of small windows. On the other hand, in a public or monumental kind of building we see a larger unit adopted, or perhaps one order of columns used to give dignity to two stories. Lingo

James's Panopticon House, Whitehall, is a good instance of a front 750 ft. high divided into two stories by two orders of engaged columns though internally it is only as fact it was intended to be a certain wing between higher blocks. It is at least a stately fragment of a great palace. On the other side of Whitehall the Treasury, with its single order of Corinthian columns on a basement, is another example of a masked front but dignified, and more in the large block of Government offices, not a very satisfactory front, as it has the window or story unit rather large. One strong reason for the employment of columns and pilasters is that it helps to unite the shape of a lofty structure and produce unity and largeness of parts, and it is only when single orders are used without any external evidence of scale that the actual size of the building suffers. For these reasons we conclude that a building of many stories and windows with the many tiny human figures seen from a distance will be a failure. The eye gets weary of the repetition of windows of similar size, though at the same time we can estimate its height and magnitude by this division better than we can when a larger unit is employed. What we lose by smallness of parts—dignity—we gain in apparent size. All are agreed that the most obvious element of architectural grandeur is size, and of two buildings of like design, though of different size, the more imposing and dignified is the larger; and, in fact, this quality of grandeur or sublimity is to be found in direct proportion of the dimensions.

We may confine our remaining remarks to discuss a few of the ways this element can be ignored. One of the commonest ways in which scale is lost sight of is the juxtaposition of two buildings having different window units though of the same height. The eye immediately notices the larger size and dignity of the one having the larger unit, but for their juxtaposition the house with the smaller windows would appear the larger. In this case the smaller division is not conducive to dignity. Our street architecture is full of these anomalies; four or five-storied houses crowded with window openings close to others of only two or three stories, entirely cutting off all lateral continuity. The scale of a public building, say a public office, does not go well close to an ordinary dwelling-house, and it is for the architect to try to adjust the lines of his facade as suitably as he can in such a case by preventing any discordant break. Or the buildings may be of varying height, the scale of the larger completely dwarfing the adjoining one. In such a glaring discrepancy as to size, it is well for the architect of the latter to observe a happy medium by adopting a unit of window or story—that is, not too small, at the same time avoiding anything like imitation. The contrast of the larger edifice to a smaller scale, as such a treatment, would make the comparison almost odious, if not grotesque. If columns exist in the larger scale, it is better to avoid them in the smaller altogether, so as not to draw any invidious comparisons. Two towers or pinnacles, for example, one twice the size of the other, would be like "Dignity and Impudence." It is a difficult task for an architect to avoid overpowering or swamping an adjoining edifice of smaller size, it is still more difficult to select features and details for a small front that will be sufficiently independent of the large edifice as not to invite comparison. Similar features of different dimensions should not be brought so near together as to provoke discord or ridicule. And yet we see one facade with an arched front, and another close beside it of half the size. Still more frequent is the repetition of a smaller scale of a series of engaged columns or pilasters. Both the arcade and the colonnade are used in proximity in the manner described, pressing comparison by

their varying dimensions, the smaller suffers the most by the contrast. The disparity of scale is more noticeable in features of this kind, and the architect ought to avoid them. Scale also is much modified by large and small details and carving. How often we see a pediment over a doorway heavy and coarse in projection and mouldings, perhaps adorned by a piece of carving that overpowers the doorway beneath, with trusses and pediment of considerable size. The entrance looks crushed beneath. Instead of which, the entrance ought to have been made the unit of the work; if of the ordinary size, the moulded work should have been refined and delicate, giving scale to the front. Or it may be a series of heavy carved capitals to the pilasters of a shop-front that throws out of scale the whole facade. Heavy and cumbersome keystones, and trusses and cornices, by reducing the relative size of other details, are common enough in many buildings. But the adjectives "large" and "small" are relative terms that require definition. We need to establish a unit of comparison, and this should be the height and width of the door-opening. The small doorway of, say, 8 ft. by 4 ft. would be regulated by the proportions laid down by Vignola or Chambers, founded on the width of the aperture. But the modern architect, in proportioning the entablature or pediment of his doors and windows, often does so independently of any scale of the width of opening, or the diameter of column. Instead of making these details proportionate to the size of door or window, he makes them of almost any size and proportion he thinks right. In this manner he designs his mouldings too heavy and large, and throws out of scale the rest of his work. The size and projections of the main cornice of a facade will, of course, be proportioned to the height of the order or facade; but that of a minor feature must be regarded as a mistake, and it is by neglecting this rule of composition that the scale of the mouldings, architraves, projecting pediments, and other parts is lost. Carving is another matter that ought to be designed and executed to a certain dimension suitable to its height and position. The rustications of a pier or quoin indicate scale, and should be carefully divided. Similar principles of proportion apply to interiors: the height of a room being fixed, the size of the doors and windows ought to bear a certain proportion to it, and their decorative details be regulated by the height of an opening. In all his drawings and sketches of the parts of buildings, sections, and diagrams, Viollet-le-Duc introduced figures which give a true scale to them; all decorations ought to be based on the human figure as a unit of measurement. It is pointed out by some of the examiners in their reports on designs submitted for the National Competition, that the use of a scale has been neglected in many instances by students, and the importance of the subject in designs for building is also underrated.

SANITARY IMPROVEMENTS AND OVERCROWDED AREAS.

DURING the almost tropical heat which we have been experiencing during the last few weeks, it is not inopportune to direct attention to the sanitary conditions of our towns and especially the Metropolis, where all sorts of contributory dangers to health lurk. We may at once admit that the sanitary state of London is far better now than it has been during the last half-century; hygienic laws and regulations have been adopted in removing refuse, in drainage, the closing of buildings unfit for habitation, the provision of space about them to insure ventilation, and various other matters; but while we have made great progress, the population has gone on increasing at an

alarming rate, and the developments of objectionable manufactures have added to the common stock of dangers. Although we have coped with many of the worst evils of overcrowding, new risks have arisen that require serious attention; while we have been engaged for many years past in clearing unhealthy areas and demolishing pestilential dwellings, we have been sweeping the poorer classes into other dwellings, and at the same moment adding to the risks of overcrowding in another way. With one hand we have been clearing certain overcrowded areas of small tenements, with the other erecting on the same area or near it colossal, many-storied blocks of dwellings or flats, and thus we have been undoing the good by adding to the evils in another form. The report of the Medical Officer for Liverpool repeats the experience of London, that by rehousing the people displaced upon sites from which the unsanitary property has been removed, the congested condition will have had an over.

The sites are often surrounded by warehouses and lofty buildings, which shut out the sun, and are also rendered unsuitable for the working classes by the low-lying situation. In London the number of persons that occupy flats per acre is considerably greater than those originally housed on the same area; and it is this fact that we have to consider. Is it possible to increase the density of population per given area without evil consequences to the health of the community? We have to consider the outbreak of infectious diseases in blocks of flats. For hygienic as well as for economic reasons the provision of areas outside the denser parts of our towns appears to be necessary. The Medical Officer of Liverpool alludes to the fluctuating character of the work. Thousands of labourers and their families, shifting from place to place, follow large contracts, and a large percentage of the workmen are engaged a mile or two from the place where they find their food. We conclude that it is possible to provide for a large number of distressed tenants in the less crowded parts within easy reach of train and tram. The conditions of London labour are rather different. Thousands of the labouring classes who now live in squalid tenements and flats are permanently employed near the great markets like Covent Garden, and are therefore obliged to dwell within a reasonable distance of their work. The Nemesis of overcrowding has thus taken a new form in one of the grievances which the authorities of modern towns have to meet. The most effective course is to remove the cause—to get rid of congestion in any form by aiding the working man to live outside a certain area. The one next in efficiency is to compel cleanliness and isolation as far as possible. To build flats and associated or self-contained dwellings on the best plans, providing for the separation and isolation of individuals as far as possible; to reduce the number of common offices; to provide the best sanitary fittings, are the chief means by which the risks of overcrowding can be minimised. In this result the new by-laws framed by the London County Council under section 202 of the Metropolis Local Management Act will, by enforcing a uniform code of regulations as to house-drainage and sanitary fittings, aid most materially. Indeed, we must attribute the imperfect and insanitary state of London to the want of by-laws. Till quite recently every vestry or board had their own regulations and views as to house-drainage, which have contributed to the ill-effects of a great deal we still endure in the Metropolis. The domestic fittings and sanitary accessories of buildings are now being gradually improved in type and construction. Traps and soil-pipes, as we know, have been only lately taken in hand. Conflicting views and legislation relating to drainage and to traps and soil-pipes have much hindered sanitary

gress. Thus the by-laws under one Act the Metropolitan Local Management, conflicted with those under the Public Health (London) Act, one of the most essential provisions, that referring to the ventilation of underground drains, did not exist under the latter Act, and it is only by repealing some by-laws and introducing others that a complete code has been framed combining the fittings and underground drainage. These new drainage by-laws for London came into force in June last, and will materially change the present condition of present house sanitation in the metropolis.

One of the main provisions affecting the class of large areas is the drainage of subsoil. This by-law, the first of the code, is to assure that the subsoil of all new buildings shall not be subject to the saturation of sewerage be pervious to the air from a sewer passing beneath a house. The by-law states that any person who shall erect a new building, and cause the subsoil of the site to be drained by means of a drain communicating with any sewer, "shall not construct such subsoil-drain in such a manner or in such a position as to communicate directly with such sewer; but shall provide a suitable trap between such subsoil-drain and sewer." It also provides for a ventilating opening to such trap communicating directly with the open air. Such an arrangement may be insured by a suitable trap of the type fixed in an inspection-chamber, or by a Buchanan trap in the shaft. The latter to have a suitable grating, to allow free passage of air. By this by-law, all new houses will be cut off from the soil and underground water and gases. The next by-law provides that any inlet to a rainwater drain is to be trapped, and this will apply to all forecourts, paved yards and areas, so that no sewer-gases will be able to enter the drain. All rainwater-pipes are to be charged over a proper trap, thus preventing these pipes becoming transmitters of poisonous gases to the open windows of rooms. Under the same by-law it will be permissible to allow sinks and lavatories to discharge into rainwater-pipes—a course that is often adopted, and has given rise, no doubt, to serious epidemics. These are a few of the hidden sources of mischief that have prevailed hitherto in London.

The by-laws referring to drainage require a use of sound glazed stoneware pipes, or stoneware, the drains to be laid on a bed of concrete 6 in. thick, and projecting on each side at least 1 in.; that drains under buildings are to be imbedded in concrete, 6 in. thick all round. How many new buildings erected within the last few years have served any of these precautions, which buildings are still centres of infection! Hence, as a matter of fact, sanitary legislation is some too late to have any real effect on the thousands of houses built on new estates within the last few years. Perhaps one of the most important by-laws passed is No. 8, providing for the efficient ventilation of all buildings communicating with a sewer. These alternative arrangements are given, which are fully described in the by-laws. The one we think the most efficient in ordinary cases is (b), in which the vertical pipe or shaft is carried up from a point on the building side of the trap as an outlet, and either a fresh-air inlet opening made at the top of the house near the level of ground communicating with the drains, the effect of which is that the current of air through the shaft is in the same direction as the sewerage. In method (a) the current is in the contrary direction to the flow, but is best adapted to small houses. It is needless here to point out the details of each of the methods. Any of them insure ventilation of the system of pipes which form the drains of a dwelling-house, at the same time effectually disconnecting the drains, soil, and waste pipes from the use itself. Why, we may ask in paren-

thesis, do the framers of these by-laws and those who annotate them persist in spelling the word "siphon" with a y? Surely in official documents of this kind the correct spelling should be used, as there is no authority in Greek or any other language for the latter rendering.

There are, however, dangers in our streets and by-ways that still exist, and which the new by-laws do not touch. We refer to one of a very common kind that exists in many of our older streets that has not yet received the attention of sanitary authorities—namely, the open area or grated opening in the pavement of our streets. In country towns the objection to these open window areas is less strong, as the traffic is small, and cleanliness is more looked after than in London. Any one who passes certain streets day after day must have noticed the filthy condition of those receptacles for dirt and refuse; these areas for light to the basement windows of street houses. We cannot call them anything less objectionable than receptacles for rubbish and decaying matter. We seldom see them cleansed, as all the refuse would have to be carried in many cases through the window and room, because the street gratings are generally fixed. They are not only receptacles for dirt and refuse, but they must become centres of infection as well to the inmates of the house, and a nuisance to those who pass over them on the paved footways. During hot or sultry weather these grated openings often emit odours of a very obnoxious kind which foot-passengers cannot escape. We should like to know how many of these window areas are ever cleansed; how many are provided with means of drainage; how many have movable or hinged gratings. If we cannot abolish them, we can at least provide regulations for their periodical clearance, and in our crowded and narrow streets their value as light areas must be small, and it would be better to close the opening on the pavement level by means of those excellent pavement and floor arrangements as that of Hayward's "Pludex light," or the other forms in the market which throw in a flood of light. It is better that we seal these openings by providing suitable lenses and means of ventilation than that we should permit open areas to pollute the air of both the basements and the streets. The provisions as to the occupation of underground rooms, section 96 of the Public Health (London) Act, 1891, define certain rules for the height and construction of such rooms and areas in front, but do not meet the case we have mentioned for basement rooms not so used.

The conditions of our streets call for improvement. During the dry, sultry weather of the last few weeks the state of the roadways, whether of stone, asphalt, or wood has been of the most insupportable character; the desiccated manure and refuse emit a most offensive odour, which could be prevented if the paved surfaces were cleansed at stated intervals every day. Such methods of cleaning are to be seen in the capitals of most Continental countries, where water is more liberally used. The constant breaking up of these surfaces for the purpose of laying down pipes and telephone wires, and for repairs to mains of water and gas systems, is by no means conducive to health in our large towns, and the extension of the subway system is becoming more urgent than ever. Again, the number of vacant areas cleared for new buildings and streets call for more repressive measures. In the neighbourhood of Covent Garden, for instance, these open areas are taken advantage of for the deposit of refuse, decaying vegetable and animal matter, which, when soaked by rains and dried under fierce suns, become a source of nuisance to the inhabitants of surrounding houses. Unless protected by high hoardings, these vacant spaces frequently became in our towns greater

sources of nuisance than built or covered areas. Many dangers to health lurk, too, in out-of-the-way corners and courts inseparable from the necessities of a great city, in corners of vacant buildings, in recesses and other spots that can be made convenient refuse heaps. There are thousands of such corners in London which seldom get interfered with by the sanitary authorities or their officials. Many of the more crowded streets and alleys in the East End have their pavements or footways strewn with refuse, both animal and vegetable, which is swept out into the footways by the smaller shopkeepers. These are only a few of the many plagues and spots which at the present time render the denser parts of the Metropolis both unsavoury and germ-producing, and must contribute to the unhealthfulness and death rate of districts thickly populated. A great deal has been done to open up and clear away slums and "back lands"; but we have yet to learn the lesson which has been dearly taught by the experience of half a century: the displacement by demolition of thousands of the working classes before new accommodation of a suitable kind is provided, with the consequent overcrowding of the worst class. The size and rental of the poorer dwellings are vital points. Large sums of money have been expended on the erection of flats, which in the lower floors are by no means healthy. Some of these huge blocks stand only 20 ft. to 30 ft. behind similar blocks which face the street—a condition of building in no way creditable to our sanitary arrangement. The rooms also are cramped and small in some of these—smaller and dearer than they are in Glasgow. These and many more things can be urged against a system of wholesale reconstruction on a financial basis as the one panacea for overcrowding overlooking the Nemesis-like retribution awaiting us in the future.

THE STEELWORK IN SKELETON BUILDINGS.*

THE present architectural design of buildings in which an iron frame is used for supporting the masonry is the cheapest form of dissimulation, and we can imagine the disgust with which our successors in years to come will regard the work of the present generation. The cause of this trouble lies in the attempt to apply the same architectural details to a skeleton building that are usually applied to a masonry building, or, in other words, to apply the architecture of stone to a structure of iron. The fundamental basis of the present architectural forms has the merit of once having stood for something of utility. The console, the dentil, the pilaster, the column, all once had a utilitarian office, and to them ornament has been applied until they have assumed a graceful form and have become the words of the architectural language in stonework. But they had the truth for their prototypes, and they have consequently developed rationally. The architecture of the iron building, which is so indefensible because it is, first of all, a sham, a mere pretence, purporting by its detail to be a masonry structure, yet violating every principle of masonry construction. It is ridiculous, to say the least, to see a building in which the cornices, brackets, and consoles, which are the visible evidence of the bones of the building, and apparently support the work above them, are wired or strapped to the iron skeleton. The galvanised iron cornice and similar shams are surely no worse. The solution of any problem is arrived at by a series of compromises, and any one charged with responsibility should fully understand what those compromises involve from an artistic and utilitarian point of view: for the best results cannot follow when one or the other is ruthlessly sacrificed without consideration: but with a proper appreciation of the value of the two, an architectural and structural solution can generally be found which does justice to each, and is also practical.

THE FIRST AND MOST IMPORTANT THING to be done, after the requirements of arrangement

* Extract from a lecture delivered at the School of Architecture, University of Pennsylvania, by Mr. WILLIAM CORLEND FORBES, M.A.M.Soc.C.E.

DEAL BOARDING.

Description.	1in.	1in.	1in.	1in.	1in.	2in.
Rough, supplied only, on site, including profit	s. d. s. d. s. d. s. d. s. d.					
100 ft. sup. 100 ft. sup.	0 10 0 10 0 10 0 10 0 10	0 11 0 11 0 11 0 11 0 11				
Add if edges short	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0				
" if wrought one side	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0				
" " both sides	0 1 0 1 0 1 0 1 0 1	0 2 0 2 0 2 0 2 0 2				
" if tongued and grooved	0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1				
" if framed	0 3 0 3 0 3 0 3 0 3	0 3 0 3 0 3 0 3 0 3				
" if cut and puttied	0 1 0 1 0 1 0 1 0 1	0 2 0 2 0 2 0 2 0 2				
" hung (exclusive of hinges & screws)	0 1 0 1 0 1 0 1 0 1	0 1 0 1 0 1 0 1 0 1				

1in. gutter boards and batten	per ft. super.	0 6
Rebated drips	per ft. run	0 6
1in. 6in. rough deal ridge board	per ft. run	0 2
fixed		0 3
1in. deal dovetailed cross-spool, 9in. by 2in.		0 2
6in. hollow sash line	per ft. run	0 2
Curved work, bent in fixing, is 1 1/2 price of straight.		2 6
Curved face, as to cylinders, &c., is 1 1/2 price of straight.		
Curved on plan, as to ribs, &c., is 2 price of straight.		
Curved work, glued up in thickness, is 3 price of straight.		
Double the foregoing prices for oak.		
Rebate the foregoing deal prices for mahogany or teak.		

(To be continued.)

AUSTRALIAN TIMBER AND TIMBER-GETTING.

THE timber resources of the Australian Parent State, although largely wasted in the past, are yet of a most extensive character, and under the present system of conservation would become as valuable as any in the world. In a report by the Queensland Inspector of Forests, descriptive of a visit to New South Wales, that official states that on the Murray River, dividing New South Wales from Victoria, are situated the far-famed Murray River gum forests, the area of forests extending a distance of about 200 miles on the frontage of that river, but with occasional breaks, and running back from the river on an average of from one to six miles. New South Wales has an area of about 140,000 acres reserved for this timber, most of this country being liable to floods and densely timbered with gum, from the matured trees to the sapling and seedling. As showing the extent of the timber trade in the district, it may be mentioned that during the season December, 1900, and April, 1901, the quantity of timber obtained was 5,393 logs, containing an average of 1,150 superficial feet per log, equal to 6,197,500 ft. of timber, on which royalty is payable at £4,497 8s. 5d. at 1s. 3d. per 100 superficial feet. The greater portion of this timber was cut on behalf of a Victorian company, and is stacked in depots on the higher banks of the Murray River, pending a rise of water, when it is removed by pontoons and punts, towed by small steamers to Echuca (Victoria), where it is cut into slabs, piers, mining timbers, and for bridge and building purposes. The system of working is that any person desirous of cutting gum must apply to the State Head Forester for a permit, for which he pays 10s. per month, and may employ as many men as he may desire, giving to each a certificate that he is employed by the State Head Forester. Under a certain portion of the reserve on which the permit may be used, and as the timber is cut it is branded by the Crown at the stump, both log and stump being branded with white lead, each with a running number as well as with its length and circumference, a sub-forester entering every such log in his book for the State Head Forester's information. The timber is then removed to the river depot, and if left in the depot for three months, royalty must then be paid thereon. For instance, timber removed to the depot in January would have to be paid for at the end of April, and if removed after the royalty is paid the owners must still hold a permit costing 10s. per month. On the Murray River red gum is allowed to be cut under a circumference of 7ft. 6in. at 5ft. from the ground, but small timber for piles, girders, &c., can be obtained at 15s. each up to a length of 30ft., but above such length 6d. per running foot is charged. For the purpose of assisting in the production of this timber a system of thinning-out and cleaning-up of the reserves is adopted, and about 25,000 acres have been dealt with on the following lines:—Gangs of men, about twelve in each gang, are employed under an overseer at a wage of 7s. per diem to the men, and 8s. to the overseer to ring-bark the gum and useless trees, and to then cut out waste or cracked saplings, the latter being rooted out; and as this is done all fallen timber is gathered in heaps and burned, thus cleaning-up the reserve. This work costs

from 6s. to 10s. per acre. The outlay may appear heavy, but it is most valuable, for the following reasons:—(1) It prevents the destruction of numberless plants, saplings, and trees by fire, through the fallen timber making a fire-larger volume of fire than the grass alone would make. (2) The destruction by ring-barking of useless timber, and the clearing by fire is found to produce numberless young gum plants, and to greatly increase their growth. (3) As each tree or sapling fit for cutting as a pile is worth at least 10s., the cost of the work is not to be compared with the future benefit to the State therefrom. (4) The clearing-up of the reserves, which are in many parts left at a rental of 3d. per acre for grazing, tends towards obtaining a higher rental by the increase in production of grass for pastoral purposes. (5) The dead trees and logs being cleared enable the timber-getters to work more timber. (6) From examination of portions of the reserves before and after thinning out and clearing up, and from the healthier appearance of the young trees on the cleared areas, in comparison with those uncleared, and which it is considered is due to the trees obtaining a larger proportion of light, it is concluded that the work it appears that the work will be reproductive and greatly assist to maintain an ample and permanent supply of matured timber.

CHIPS.

Cardinal Vaughan formally opened on Sunday the new Catholic schools for blind children which have been erected at Rice House, New Tree Lane, West Derby, Liverpool. Situated on a site of about 25 acres, adjoining the Roman Catholic Cemetery grounds, the new building provides accommodation for between 100 and 120 children. The department is of sufficient size to provide for double that number. Being intended for the blind, a large portion of the buildings is only one story high.

The Estate Mart, Tokenhouse-yard, only opened for two days after the August holidays last week, and the business was of a most prosperous character, the total sales amounting to £15,100. The monthly summary shows that in July this year the sales at the mart amounted to £1,028,750, as compared with £875,430 in the corresponding month last year.

The Primitive Methodist church and schools, (Gilling, Kent), have been visited by Mr. J. E. Shorland's patent exhaust roof ventilators and special inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother, Manchester.

Mr. A. A. G. Malet, A.M.I.C.E., an inspector under the Local Government Board, has held an inquiry into the application of Mr. A. A. G. Malet, Rural District Council for sanction to the execution of the Hartshill sewerage scheme.

The Leek Rural District Council have instructed Messrs. Wilcox and Raikes, of Birmingham, to prepare a scheme for the sewerage and sewage disposal of the parish of Ewson within their district.

A scheme for the acquisition of foreshore rights at Felixstowe, and the laying-out of the cliffs and foreshore, at a cost variously estimated at from £20,000 to £50,000, is to be considered by the urban district council in committee.

The Newquay Railway, in course of construction, has been brought into touch with the Great Western main line at Chaucester.

On behalf of the Local Government Board, Mr. R. H. Bicknell has held an inquiry at Newark into an application of the rural district council for sanction to borrow £12,000 for the sewerage and sewage-disposal scheme for the parish of Balderton.

The official inspection of the latest extension of the Sunderland electric tramway to Grange Road was made on Monday by Col. Von Duncop, the Board of Trade inspector. Subsequently the first public car was run from Grange Road to Sea Lane End, Roker, a distance of about 2 1/2 miles. The new section is 1 1/2 miles in length, and runs from Vilett-road, Hendon, along the Ryhope-road to Grange-town—a growing district.

The town council of Galashiels elected on Monday Mr. William Thomson, of Stirling, as burgh surveyor and master of works at a salary of £120 a year.

The Newport and Monmouthshire Hospital, on Cardiff-road, Newport, was formally opened last week. Messrs. A. S. Morgan, Newport, were the contractors for the building. Mr. R. J. Lovell, of 46, Queen Victoria-street, London, was the architect. The building is a fine example of apparatus, electric light installation, and electric bells were fitted by Messrs. R. Alger and Sons, Newport. The arrangements for the electric lighting were carried out in the direction of Messrs. Wallace-Jones and Dent, consulting engineers, Westminster. The cost has been about £20,000.

Building Intelligence.

BLACKBURN.—The Victoria wing just added to the Blackburn and East Lancashire Infirmary was formally opened last week. It provides a new board room, and accommodation for resident doctors, aged nurses, and for outpatients. Messrs. Simpson and Duckworth, Richard Chambers, Blackburn, were the architects, and Mr. J. F. Woolf, of Pump-street, Blackburn, was the contractor. The special contract work has been executed by:—Messrs. Tomlin Huttons and Co., Stoke-upon-Trent, wall lining; Mr. J. F. E. F. Long, of Wood-block flooring; Messrs. J. and H. Pattison, Manchester, carving and marble terrazzo flooring; Mr. George Wrangoe, Manchester, wrought-steel window casements; Mr. Jas. Gibbon, locks and door furniture, &c., and Messrs. Morrison, Ingram and Co., sanitary fittings. The scheme for the heating and ventilation has been carried out by Messrs. Dargue, Griffiths and Co., Liverpool, and the installation for the electric lighting has been undertaken by Messrs. G. H. Woods and Co., of Blackburn, from the specification of Messrs. Lester, Taylor, Kelly and Hide, of Liverpool.

FARRET.—A coffee tavern, recently built at Farret, was opened on Tuesday week. The building is of red brick and tile. The interior fittings are designed with taste, a brown wash-sealing being mounted by a frieze, the work of Mr. Voysey. At one end of the room a counter is provided for the serving of customers, and about the room are placed tables. The flooring is of wood block. The room itself measures 36ft. by 18ft. The whole of the work has been executed by Mr. Gelsthorpe, of Bourne, from the designs of Mr. J. C. Traylen, Stamford, and the cost is set down at £700.

NEWCASTLE-UPON-TYNE.—The foundation-stone of the Art Gallery, which is being erected at the cost of Mr. Alexander Laing on a site in Higham-place given by the corporation, was laid on Tuesday. The buildings are two stories in height, forming one block, the hall being on the ground floor consisting of entrance and sculptural hall, and three art or museum galleries, extending through behind the public library, and lighted from the central court, the upper floor being entirely taken up with light-art galleries, four in number, averaging in size about 65ft. by 27ft. by 27ft. high to the top of the architect ceiling. The design externally, carried out in polished ashlar, is Renaissance in style, boldly treated, the ground floor forming a rusticated plinth the same height as that of the free library, and upon which are detached Ionic columns projecting out on either flank and carrying the entablature above. The upper floor is a ground floor under which are sculptured niches. The general height is about equal to that of the adjoining free library. The main entrance is 8ft. wide, flanked with double detached Doric columns with pedimented entablature, and with sculptured figures on either side. Over the arch of the doorway is a large pediment, the top of which is arched and twisted shafts on either side. The tower has a deep band of sculpture on the exposed faces immediately under the lantern, the latter being octagonal on plan and supporting a stone dome about 20ft. diameter. The contractors are Messrs. J. and W. Lowery, Newcastle, and architects Messrs. Calder and Burns, Dick, 24, Grindley-street West, Newcastle. The cost will be about £20,000.

The Cathedral work at Truro progresses. The erection of the nave continues to make steady advance, and the building of the S.W. porch and the western gable is being proceeded with. The western towers have now reached the height to which it was proposed to carry them, unless some generous benefactors offer to complete them.

The parish church of St. Mary's, Tattingstone, near Ipswich, which had been closed for internal restoration and decoration, was reopened on Thursday last week. The work has been executed by Messrs. Sturges and Sons, under the superintendence of Mr. Frank Brown, of Ipswich.

The town council of Poole have adopted a report by Mr. F. W. Lacey, C.E., in favour of the proposed salt-water tower. The tower is to be erected on Constitution Hill for supplying salt water to all parts of the borough for street-watering and sewer-flushing purposes. The cost of the scheme is estimated at about £1,500, application for sanction to borrow which amount has been made.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, there are many claims upon the space allotted to correspondents.

It is particularly requested that all drawings and all communications respecting illustrations or literary material should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay but infrequently arises from the Editor's name, and our communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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RECEIVED—T. R. and Son, A. W. D.—H. H. and Co.—Purcell—W. and E. Laid—B. H. (Sittingbourne).

Correspondence.

R.I.B.A. FINAL EXAM.

To the Editor of the BUILDING NEWS.

Sir,—Referring to the number of failures in the several subjects of the final examination of the R.I.B.A., the proportionate number in design is very noticeable, twenty-two out of thirty-two subjects, whilst the highest number of failures in the next subject is thirteen, and in other subjects five, three, and two. There surely must be some cause for this, and it will decidedly discourage candidates from sitting for the examination. Either the subject is not well chosen, or the time too short to complete the work, or else the examiners in this subject are not fairly critical. But the point that must occur to outsiders is upon what principle the examiners make the design, or upon what standard they work. One can quite see that in any other subject the mistakes can be absolutely picked out; but in design it clearly must be the judgment only of the examiners—“What is one man's meat may be another man's poison”—and there is a strong suspicion that the examiners favour drawing rather than design, and the draughtsmanship considered instead of the effect of the suggestion when incorporated in a building. The present fashion seems to be the dot and stroke style so popular in the modern wall-poster, rather than to the good old careful line drawing and practical designs that the older members of the profession were accustomed to.

I am strongly of opinion that this should receive the consideration of the R.I.B.A. if they wish to deal fairly with the candidates sitting for the final examination.—Yours, &c.,

F. W. T.

Intercommunication

QUESTIONS.

[11755].—Sewer or Drain.—Thinking “E. P.” for his reply to my query (1174), he has not given me what I wanted. My chat is quite willing to redrain his five tenants draining the property, but I don't know what I wish to know is whether the corporation can compel him to lay the pipes at his expense in the said public highway so as to connect to their main sewer and of his sewer, especially considering that part of their approved scheme includes a sewer and main due to the property, to be put in at a future date. Should not the corporation put the portion in which runs in the highway, or pay for it?—IS DUNSTON.

[11756].—Flow of Sewage.—Will one of your readers kindly give me his opinion on the following:—Sewage flows into a manhole through a 12in. glazed stoneware pipe, without pressure, or high velocity, but what I wish to know is whether the corporation can compel him to lay the pipes at his expense in the said public highway so as to connect to their main sewer and of his sewer, especially considering that part of their approved scheme includes a sewer and main due to the property, to be put in at a future date. Should not the corporation put the portion in which runs in the highway, or pay for it?—IS DUNSTON.

[11757].—Wood Shrinkage.—Can some reader say whether canvas glued at the back of tin, packed in a barrel, is likely to prevent wood from shrinking, or is in any other way beneficial? The framing to be fixed against new brickwork.—E. C.

REPLIES.

[11748].—Quantities.—I think “R. W. H.” should be very well satisfied to get ten per cent. on what is spent without earning it. I cannot get paid ten per cent. on the cost of the work, or on the cost of the material. I should advise him to accept it very gratefully.—W. HOFFMAN, WOOD, LEEDS.

CHIPS.

A painted glass window in memory of the late Duke of Westminster has been placed by the Duke of Devonshire at the entrance of the new Mary's Church, Bond-street, Berkeley-square, which was erected twenty years ago by the late duke as a chapel-of-ease to the mother church.

Mr. James Hutton, architect, of 61, Reform-street, Dundee, who with his wife and family had been staying at Montrose, was drowned while bathing on the beach at Charleston, Mr. Hutton was a member of the Dundee Institute of Architecture, and practised in partnership with Mr. G. A. Harris.

Mr. John Frostbeck, High Bailiff, and a special jury, sitting at the Guildhall, Westminster, on Monday awarded Mrs. Couturier £1,143 as compensation for the compulsory acquisition by the County Council of her premises at 14, Holwell-street, for the purpose of the new thoroughfare from the Strand to Holborn.

The building committee of the Lincoln Board of Guardians reported last week that they had received the following tenders for proposed alterations to the infirmary buildings:—Messrs. Close, £349; Mr. Walker, £260; Mr. G. A. Harris, £260. The lowest tender was £260, more than the lowest tender received for the same work last autumn, when it was so much in excess of the estimated cost that it was decided to defer the matter until now. In view of the high prices, it was decided to refer the matter to the house committee, with a view to seeing if the alterations are really necessary.

The first annual picnic of the Crewe and District Builders' Association took place on Thursday, when about 100 members of the association and their friends spent a delightful day at Trentham. At luncheon at the Trentham Hotel, Mr. J. Williams (president of the Association) presided.

The building committee of the Atham Board of Guardians, Shrewsbury, have decided that an architect should be employed to draw up specifications for altering the structural arrangements of the workhouse, so as to provide for a ready way of escape in case of fire.

The Auctioneers' Institute of the United Kingdom will meet at Edinburgh on Thursday, Friday, and Saturday, the 14th, 15th, and 16th of September. The usual autumn conference will be held, and an attractive programme of excursions to places of interest is being arranged.

PARLIAMENTARY NOTES.

THE WIDENING OF PISCADILLY.—Mr. Coghill asked the First Commissioner of Works last week whether he would consider the expediency of having of Piscadilly until the next upon traffic of the proposed continuation of the Mall into Cockspur-street had been ascertained. Mr. Buxton asked that the work should be suspended until next year, that the one might be done in the next year, considering the proposal. Mr. Akers-Douglas said he would consider that, but he pointed out that the scheme was before the House last year. He did not think the alternative suggested was a very good one, but it was a very appreciable effect, seeing that no heavy traffic or omnibuses could use the route; but the point would be considered. Mr. J. Lowther asked, Was not the scheme very generally considered by the House? Mr. Akers-Douglas said he was not aware of that, and he ventured to think that the scheme could be defended, and that if the public knew exactly what was intended objections would be easily answered.

THE VICTORIA AND ALBERT MUSEUM.—In reply to Mr. Macarty-Muir's question last week, Mr. Akers-Douglas said: The foundations are completed, and the contract was for £33,410. A second contract has been made for building to the ground-floor level, and this work is now being proceeded with. As soon as this is finished, the contractors will once be invited for the superstructure, the plans being now practically ready. No alterations that I am aware of have been made which would reduce the size of the museum, or the quantity of important work required. The work being completed within the allotted time. The contract for the foundations was not entered into until some time after the laying of the memorial-stone, the ceremony having taken place in advance to suit her late Majesty's arrangements.

WATER SUPPLY AND SANITARY MATTERS.

COLWYN BAY.—Last Friday, at Colwyn Bay, a meeting of the Conway and Colwyn Bay Joint Water Board was held. It was decided to borrow £2,500 for a period of thirty years, at 3½ per cent. for extension works. The engineer (Mr. T. B. Farrington) submitted plans of a suggested new line of pipes from the lake, along the Denbighshire side of the Conway River, to Glen Conway and Llan Llyfarch, the object of which is to give Colwyn Bay and Llysfaen an increased supply without affecting that of Conway. Five alternative schemes were set forth, and the estimates were considered.

EDINGTON.—An inquiry was held at Edington last week by Mr. Meade-King, inspector under the Local Authorities (Sanitation) Act, 1890, applying to the Edington Urban District Council for sanction to borrow £7,000 for works of sewerage and £2,750 for the improvement of a main road. A sum of £2,750 is intended to be used to pave the footpaths along the main road, and the rest for the purpose of enlarging a portion of the existing drainage sewer at Bleak Hill. There was no opposition.

The Mortimer-road new Board schools at South Shields were formally opened on Monday by Mr. W. S. Robson, K.C., M.P. The schools accommodate 1,200 children, and will cost over £19,100. Mr. J. W. Donald was the architect.

A light railway has been opened in the Isle of Sheppey. Single throughout, of standard gauge, it is a junction of the Great Eastern and the Sittingbourne and Sheerness branch on the South-Eastern and Chatham system, the line runs in an easterly direction. Stations have been erected at Sheerness, East, Minster, Eastchurch, and Leyland, where the line, nearly nine miles in length, terminates facing the open sea.

On Monday night the House of Commons agreed to the resolution authorising the expenditure in connection with the National Gallery (Purchase of Pictures) Bill. The Government Bill on the same subject passed through Committee without amendment, and was reported to the House. The measure has now practically passed all stages, and will be introduced into the House of Commons on Tuesday. The Bill provides for the purchase of the Gallery by the Government, which adjoints the Gallery will be pulled down, leaving a clear space of 35ft. between the Gallery and the stables at the north-west corner and 10ft. between the Gallery and the stables at the building at the south-western angle. This, however, is manifestly inadequate to effectually safeguard the priceless treasures housed in the iron-girded group of buildings known as the National Gallery, by such diverse architects as Wilkins, E. M. Barry, and Sir John Taylor. The special Parliamentary Committee appointed to consider the advisability of purchasing additional space for the National Gallery in their report last Friday. They recommend that as soon as possible land in addition to that already bought should be acquired in order to make the protection from fire more effective.

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Our Illustrations.

BROAD STREET PLACE, E.C.

The famous site lately occupied by the well-known Roman Catholic Chapel of St. Mary, Moorfields, together with the land on which the Ophthalmic Hospital stood, has been cleared, and a very large block of commercial buildings will be designed by the designs of Mr. D. D. Martin, architect. The alteration is one of uncommon importance, vastly changing the character of the thoroughfare out of Finsbury-circus known as Broad Street-place. The double-page plate which we illustrate to-day shows the architect's original design, which in working out has, we understand, been somewhat modified, and we are promised a drawing later on in representation of the work as it will appear in execution.

BLUE COAT HOSPITAL, LIVERPOOL.

In preparing this design, which was submitted in the recent limited competition, a special effort was made to keep the buildings very compact, to give as much space as possible to the playgrounds and playing-field, and to make the building suggestive of the existing front in School-lane. The site slopes down 20ft. from the east to west, and the rock being very close to the surface, it was considered advisable to interfere with the levels as little as possible. Accommodation is provided for 250 boys and 150 girls. As the school is a charity which educates and clothes children from the lowest classes, economy was carefully studied both in plan, elevation, and maintenance. At 9d. per foot cube the design would have cost just £90,000. The authors of the design are Messrs. Grayson and Ould, of Liverpool. The four competitors in the final competition for this building were all, we understand, paid a premium of equal value. The chosen design was illustrated in the BUILDING NEWS on Aug. 2.

THE GEORGE WOODFIN ALMSHOUSES, SHEFFIELD.

These almshouses have been recently erected in the Ecclesall-road, Sheffield, by the trustees, in accordance with the bequest of the late Mr. George Woodfin, of Sheffield, and the work of erection was entrusted to Mr. W. R. Bryden, F.R.I.B.A., of Buxton, Derbyshire, as the result of his being the successful competitor in a limited competition. The buildings comprise 18 almshouses and a large common room or reading-room, and each house contains a good-sized living room with bay windows, scullery, larder, &c., on the ground floor, and on the first floor two bedrooms and other necessary accommodation. The buildings are faced externally with red bricks and stone facings, and tile roofs, and harmonise well with the surrounding scene and background. The group has cost upwards of £3,500. Mr. Jas. Salt, of

Buxton, was the builder, and Mr. Brook Bray, of Sheffield, the landscape gardener, and Mr. W. Wood Lee the clerk of works.

RESTAURANT AND CLUB, HIGH STREET, STRATFORD.

This building is the first of a series intended to be erected by the West Ham Club and Restaurant Co. The company's prospectus contains the following: "The company has been formed for the purpose of establishing and conducting in the county borough of West Ham (and elsewhere should it be so determined) club-houses and restaurants, and of providing therein refreshments, sleeping accommodation, amusements, and recreation for the industrial classes. It is proposed to encourage athletic clubs, friendly and other societies to make the establishment their headquarters, and thus insure a volume of trade and extend the popularity of the house." Beyond the accommodation shown in the illustration, there is a basement containing a large coffee and smoking-room, the kitchens, and the necessary stores and heating-chimney. The work has been carried out by Messrs. Kingdome and Sons, of Oxford, under the superintendence of Mr. S. B. Russell, F.R.I.B.A., of 11, Gray's Inn-square, W.C.

NEW SWIMMING BATH FOR WORKPEOPLE, MAINE, U.S.A.

The new swimming-bath now being erected at Maine, U.S.A., is, we believe, the first of its kind in America. The buildings are of a private character, and will be used solely by the workpeople employed in a large paper factory on the river bank. The materials employed are local bricks, with red-brick facings and local stone dressings, whilst the roofs are covered with sea-green slates. The cold-water supply is obtained from the river, the hot water from the boilers in the factory some short distance from the baths. In order to provide greater accommodation for bathers than could be possible were the dressing-rooms placed along the sides of both, they have been placed as shown on plan in aisles on either of the gangways. Many English fittings have been introduced, whilst the general equipment is of the highest class. The work has been carried out by Messrs. C. Newman, of the Westminster Baths. The architect of the building is Mr. R. Stephen Ayling, F.R.I.B.A., of Old Queen-street, Westminster.

PROPOSED CREMATORIUM AT LILFORD CEMETERY.

The City of London Burial Board has determined to build a crematorium, and the suggested design, by Mr. D. J. Ross, M.Inst.C.E., the engineer to the Corporation of London, is shown in our illustration. From the sketch drawings it will be seen that the plan provides for a chapel 40ft. by 20ft. in width, having an entrance-porch and an ante-chapel. The cremating chamber, which will be at the rear of the chapel, will be of ample dimensions to admit of two cremating furnaces being erected, with an arrangement for the bodies being placed in either furnace by means of a traverse, with the catafalque in the centre. The building will have a flat roof with stone parapet, and will be made as unobtrusive as possible. The furnace fuel will be arranged in the centre of the tower, which will form a feature in the buildings, and will be about 80ft. in height, a small auxiliary furnace at the base of the tower being provided for the more perfect consumption of gases arising from the cremating furnace. The crypt, or columbarium, under the chapel will be fitted up for the reception of the urns, and the various monuments can be attached to the walls or niches. The buildings will be constructed principally of stone, the walls being in Kensington with stone dressings and Brossley-tiled roof of high pitch to the chapel. The designs have been made to harmonise in style and character with the existing chapels in the cemetery at Lilford. The cost of these buildings, including the furnaces, is estimated at £10,000. This mode of structure is to be made popular, buildings should undoubtedly be erected of a character that will permit of cremation being carried out in good surroundings and in a manner which should commend itself to the most sensitive.

The sanction of the Local Government Board to a loan of £20,000 for electric lighting purposes has been received by the Lowestoft Corporation. The approval of the Board of Trade to the plans for carrying out the proposed sea-defence works has also been obtained, and the tender of Messrs. Anthony Facey and Son, of Leytonstone, at £52,216, to carry out the work accepted.

COMPETITIONS.

Tonpaw. The town council of Tonpaw decided, by a majority of one, but we take to invite designs for the erection of a new winter pavilion, at a cost of £4,000 to £5,000.

CHIPS.

The Scarborough Town Council adopted, on Monday, after a lengthy discussion, the recommendations of the Corporate Property Committee, and the contracts for the conversion of St. Nicholas House into municipal offices, at an estimated cost of just over £16,000, were ordered to be sealed and the work taken in hand at once.

The colossal bronze statue of the seventh Duke of Devonshire, by Mr. W. Goscombe John, A.R.A., which has been on view this summer in the lecture-room at Burlington House, has been removed to its final resting-place at Eastbourne, and will be unveiled to-morrow (Saturday) by the Marquis of Abergavenny.

At the Cardiff Town Council meeting on Monday, the mayor proposed the adoption of the recommendation of the Public Works Committee of the Cardiff Tramways Company be purchased for £10,000, that sum to include the goodwill, engineering expenses, and prospective profits for those sections of the lines which come under the Lands Clauses Act. The recommendation to purchase was unanimously adopted.

Mr. John Kemp, at present surveyor to the urban district council of Hampton-on-Thames, has been appointed city surveyor of Brisbane, at a salary of £750 a year.

The Governors of Northampton General Infirmary, founded by Lord Halifax and Mr. Doumire in 1742, decided on Tuesday upon a scheme, prepared by Sir Henry Burdett, for the practical rebuilding of the institution, at a cost of £30,000. Sir Henry Burdett has been elected president, and received promises of £15,000 subscriptions. The alterations are chiefly necessary on sanitary grounds.

Colonel W. R. Shacke, R.E., held an inquiry on Tuesday into the application of the Liverpool Corporation to the Local Government Board for sanction to be given for the erection of 231 workmen's dwellings, to accommodate 1,071 persons, on a site known as the Adlington-street area.

A public meeting was held at Canterbury on Tuesday, at which a scheme for the acquisition of ten acres of land from the Ecclesiastical Commissioners, to be opened for recreation grounds in memory of Queen Victoria, was provisionally approved. The purchase money is to be £2,000, and one half of this has already been promised by an anonymous donor.

The Local Government Board have given their sanction to the Corporation of Colchester for the borrowing of £9,000 for new main sewers in the St. Botolph's Valley and Maldon-road districts. The borough surveyor has accordingly been instructed to carry out the work, commencing with the section from East Bay, Priory-street, Vineyard-street, St. John's-street, Chapel-street, and Essex-street, to the Essex Arms. In regard to the corporation's further application for £10,000 for sewage disposal, if any works be constructed below water mark, the consent of the Board of Trade must be obtained.

The tender of Messrs. R. Grater and Sons, at £485, has been accepted for the building of a new mission church in Chapel-street, Tiverton.

The Blackpool Corporation have finally decided in favour of the scheme to widen the promenade by 100ft., at an estimated cost of £350,000.

Memorial-stones of a Wesleyan chapel and school-room were dedicated at Ayr on Monday. The front will be of cut stone, pointed in cement, with Portland stone dressings, and ornamental brick quoins, and in the Gothic style. The seats and rostrum will be constructed of pitchpine. The roof is to be open timbered with ornamental iron-work and Portland stone corbels. At the rear of the church there will be a schoolroom, which will provide further seating accommodation for the church when occasion requires. Boyle's patent air-pump ventilators will be fitted. The architect is Mr. W. H. Kelland (Kingsbridge), and the contractors are Messrs. A. and J. Steere (Ayrton Gifford).

The Bideford Guardians have decided to abandon the idea of constructing a new workhouse, and to proceed with the construction of an infirmary on a site as near as possible an running parallel with the present infirmary, in accordance with the set of plans prepared by Mr. Hookway.

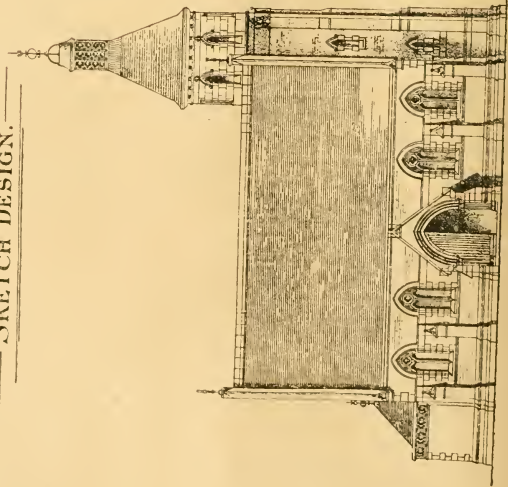
At last Friday's meeting of the Walsall Board of Guardians it was decided that twelve tenders had been received for the erection of a new workhouse laundry, and that of Mr. W. H. Hurrey (Globe, of King's Heath), was accepted, the amount being £3,200.

CITY OF LONDON BURIAL BOARD.

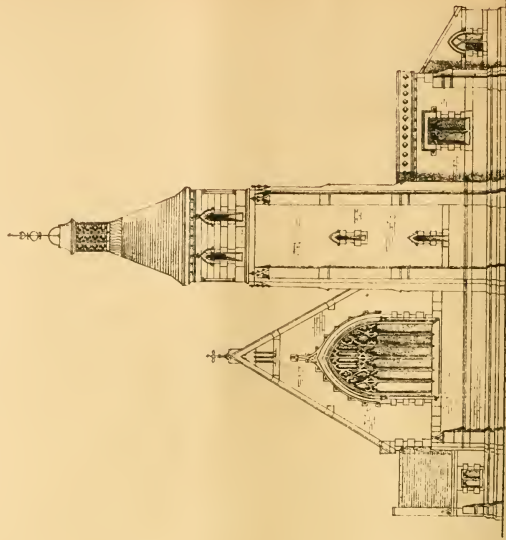
Proposed Crematorium at
Ilford Cemetery.

SKETCH DESIGN.

No. 3.

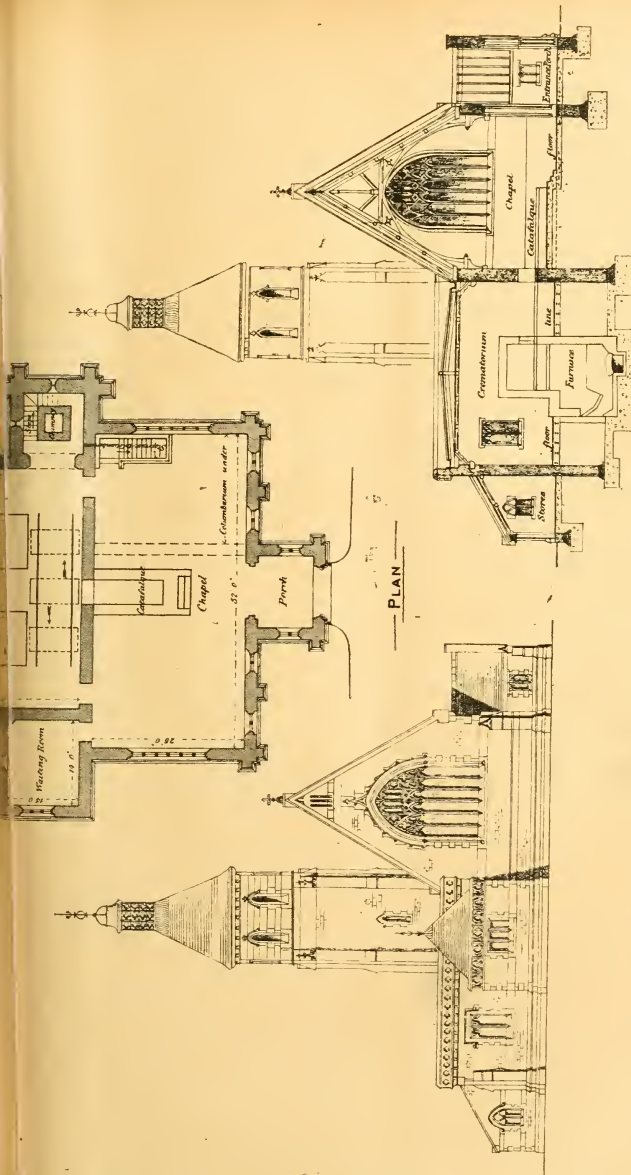


FRONT ELEVATION



END ELEVATION





END ELEVATION

CROSS SECTION

PLAN

St. Mary
St. Mary's Church
St. Mary's Church
St. Mary's Church

LEGAL INTELLIGENCE.

THE STRAND IMPROVEMENTS.—At the Westminster Guildhall, on Friday last, Mr. John Troubetzky, the High Bailiff, and the City and Westminster Councils of "Smith v. the London County Council," which was a claim for compensation for the compulsory acquisition of the premises 334, Strand, required for the purposes of the new Strand and Follies street, Mr. Edward Boyle, K.C., and Mr. Harley Dennis appeared for the claimants; and Mr. G. M. Freeman, K.C., and Mr. Edward Morton represented the London County Council. Mr. Boyle said his clients were Mr. Henry Albert Smith and his wife, who had for many years carried on the business of picture-dealers, under the name of "Samuel Courtois & Co., Ltd.," and that the late great number of years was in business in Holwell-street, but in 1886 he removed to the premises now in question. These premises were purchased in that year under a 21 years' lease, which had been renewed from time to time down to 1885, when it was renewed for another 21 years, which would expire in 1901. The shop, the rent of which under the present lease was £175 per annum, with option of renewal at £275, was well known to people all over the country as "The picture shop opposite Somerset House." They were now claiming compensation for the absolute destruction of the business, the value of the lease, and for the loss of the stock sustained by requiring to have a forced sale of their stock. They had agreed that the value of the stock was £7,500, and the question was what would be the depreciation by the destruction of this valuable stock. Mr. Henry Albert Smith, the claimant, said that his business would not follow him when he removed. There were premises to let opposite, but a tenant had been in possession for 19 years' lease, and the rent was £900 per annum. He estimated the loss on the sale of his modern pictures at 75 per cent. His annual profit averaged £1,300 per annum. Courtois & Co., Ltd., together, and Mr. Boyle announced that they had agreed that £4,500 should be paid for the loss on the sale of the stock. For the County Council, Mr. Glaisher and Mr. Herbert Farrier, surveyors, put the rental value of the premises at £400, and for the loss of the stock less than the sum mentioned by the witnesses for the claimant, and they both agreed that 11 years' purchase of the business by the County Council, Mr. Smith. The jury ultimately returned a verdict of £9,000. On the application of Mr. Freeman, the High Bailiff intimated the claimant in one half the costs on the ground that he did not deliver his statement of claim to the County Council.

—On Aug. 7, at the Guildhall, Westminster, Mr. John Troubetzky, sitting as High Bailiff, and a special jury had before them the case of "Diprose v. the London County Council," which was a claim for compensation for the compulsory acquisition of the claimant's premises in New Church-court and White Hart-street, W.C., for the purposes of the Strand improvement scheme. Mr. Edward Boyle, K.C., appeared for the claimant, a printer and bookbinder; and Sir Edward Clarke, K.C., and Mr. Edward Morton represented the London County Council. Mr. Boyle said the case was a compulsory one, involving as it did the total annihilation of his client's business. It had been agreed between the parties that the average net profits amounted to £1,119 per annum. Under the name of Diprose Brothers his client had been in business for a great number of years. In round figures they were claiming £17,700. Mr. Henry L. Diprose, the surviving partner of the late firm, said that as a result of the London County Council's notice to treat he had been compelled to refuse orders. He and some other premises to go to, and would be unable to get any more work. Mr. Edward Martin, surveyor, of Chancery-lane, said the freehold premises were worth at least £16,654. From the average net profit of £1,119 they had to deduct the rent, which was a clear £1,119. Putting that at two years' purchase it would bring the total amount of the claim up to £17,712, exclusive of the value of the fixtures and machinery, with regard to which the agreed sum had been fixed at £3,600. Mr. Mildith, surveyor to Lord Salisbury, and the Duke of Bedford, Mr. James Green, of Chancery-lane, and another surveyor supported Mr. Martin's figures, and the agreement was closed. Sir Edward Clarke, in addressing the jury, pointed out the fact that the 10 per cent. gain in compensation cases for compulsory sale originated from an arrangement made some 15 years since, to save discussion on hardships, &c., and the agreement was closed and into what they might now call law. Several surveyors including Mr. Farmer Debenham, Tesson, and Mr. Samuel Walker, of Moorgate-street, and Mr. Herbert Farrier, of the Strand, who had been in the business, estimated the total value of the claimant's property at £11,279. The jury, after some deliberation, awarded the claimant £16,700, including £3,600 agreed upon for the machinery, &c.

ROOF RECONSTRUCTION.—A case under London Building Act, 1891, of reconstruction of roofs to dwelling-houses, and neglecting to render the out-

side of the old flues where passing through the roofs, and to afford facilities for the inspection of the district surveyor, was heard at Worship-street Police-court on Aug. 8, before Mr. J. R. W. Brox, at the instance of the district surveyor of East Hackney (South) and North Bow v. J. Behrend, builder, of 225, Cambridge-road, E. The defendant had completely reconstructed the roofs to three dwelling-houses without in every case rendering the outside of the flues where they passed through the roof, and without giving the district surveyor and had covered up the roofs so that they could not be inspected, though repeatedly asked by the district surveyor to allow him to inspect them. Defendant was ordered to execute the work, and to open up the roofs for the inspection of the district surveyor within three weeks. Twelve shillings costs were given in each of the three cases.

NEW NOTING OFFICE FOR SOUTHWARK.—Mr. Robert Rogers sat as arbitrator at the Surveyors' Institution on Tuesday in the case of the Ecclesiastical Commissioners v. the Postmaster-General to assess the amount of compensation to be paid to the Commissioners for the compulsory acquisition of some property of which they are the freeholders. Mr. Freeman, for the Ecclesiastical Commissioners, said the Post Office required a piece of land on the south side of Union-street, Southwark, in order to erect a warehouse, and that the total area of the site, the total area of which was 38,000 ft. superficial, not built upon, but was used as a timber-yard, while the remainder was occupied by very old buildings on the ground was situated in the midst of a district covered with factories and warehouses, and he submitted, was a valuable site for the erection of a warehouse. The evidence of experts taken in support of the claimants' case, was to the effect that the value of the property was £32,950. Witnesses called by the Attorney-General, who represented the Post Office, valued the site at a little over £20,000. The Attorney-General, in the course of his evidence, said that the Postmaster-General, contended that the narrowness of the streets in the vicinity of the property detracted from its value as a site for a warehouse unless a portion of it were devoted to the widening of Union-street. The arbitrator reserved his award.

DECLARATION OF TITLE.—RE HAIDICE AND LIPSKI'S CONTRACT.—Mr. Justice Byrne delivered his reserved judgment on Saturday last in the Chancery Division in this case, which raised an important question, as between the claimant purchasers, on a sale of leaseholds with onerous covenants, as to the amount of disclosure necessary by the vendor before the purchaser will be precluded from questioning the title, notwithstanding an express condition binding him to accept the title. The purchasers alleged that no information had been given them as to the nature of the covenants, and that they were misled by the vendor, Stewart Smith appearing for the claimant, and Alexander, K.C., and Mr. E. Ford appeared for the vendor. Mr. Justice Byrne: This is a purchaser's case, under the Vendor and Purchaser Act, 1874, asking in effect, for a declaration that the title has not been shown, and for a return of the deposit. Beyond certain matters which I do not think can be made the subject of decision on a vendor and purchaser summons the substantial point raised by the applicants is that the property, which consists of ten leasehold houses, is subject to onerous and unusual covenants contained in the leases, and that they are held by the applicants in re-entry on breach of any of the covenants. It is of opinion that the leases do contain covenants which, in the absence of special stipulation or notice to the contrary, would entitle a purchaser to rescind the contract, and to recover the deposit, inasmuch as the applicants were not informed and did not know that the leases contained any unusual covenants, and that they were afforded any opportunity of seeing the leases prior to accepting the title. It is, I think, now well established that, whether the sale be by private contract or public auction, it is the duty of the vendor to disclose the existence of onerous and unusual covenants in the leases, and the leases of the leasehold property, and at least to afford the purchaser an opportunity of inspecting the leases (see *Reeve v. Berridge*, 20 Q.B.D. 623, and *Reeve v. Berridge*, 20 Q.B.D. 623, and *Reeve v. Berridge*, 20 Q.B.D. 623, and *Reeve v. Berridge*, 20 Q.B.D. 623, and *Reeve v. Berridge*, 20 Q.B.D. 623). Unluckily also a purchaser must bind himself by a contract to accept a bid title, as if he chooses to contract to take such title as the vendor offers in the contract, and the contract, which is very short, runs as follows, omitting the more formal parts: it refers to the ten leasehold houses with 60 years unexpired, let to weekly tenants, and the vendor is to be contented, and after providing for the purchase money, and after providing for the receipt of a deposit of 55 proceeds: "The vendor's title is accepted by the purchasers, who undertake to pay the costs of this transaction. The purchase to be completed on the day of the completion, and the purchasers will be in possession of the rents, all outgoings to be apportioned on the day of the completion." The point is whether the stipulation that "the vendor's title is accepted by the purchasers" precludes them, under the circumstances,

from insisting that a good title has not been shown. I am not aware that the effect of the precise words used in the present case has ever been the subject of decision, although there have been cases where the effect of somewhat similar words have been discussed. It appears to me that, starting with the proposition that the vendor is bound to disclose the existence of such onerous covenants as exist in the present case, or at least to afford the purchaser an opportunity of examining the lease for himself, it requires more than a declaration of title, such as general terms in the present case to bind the purchaser to take the title. As was said in "Bousfield v. Hodges" (33 Beav., 90, at page 91), "a purchaser is only bound by his acceptance of the title so far as he is not cognizant of the facts which would render the title defective by the vendor he is not as to that bound by his acceptance;" and in the case of "Jenkins v. Hill" (10 Ves., 646), which was referred to in "Bousfield v. Hodges," and cited at page 653, says, "Where the vendor is plaintiff, if the rule is founded in a principle of conscience and requiring all possible security to be given to a purchaser, the Court will at least take that view, but it is contended that the defendant has waived his right to a reference it shall be clear that there was no surprise upon him and there has been a full and fair representation of the facts, and the purchaser, the plaintiff, not merely that representation, which conscientious man would make after due diligence, but that a conscientiously diligent man would make. But where, from fraud or surprise on the part of the plaintiff, there has been deficient information, the Court will take care that a defendant shall never be surprised by the effect of a submission made upon want of full information." Lord Eldon was of opinion that the rule was founded in conscience, and the same principles as to the necessity for full disclosure apply. I think the purchaser has a right to assume that when a condition in the terms of the contract is entitled to succeed, the vendor has disclosed what it is his duty to disclose, and that the conditions must be read precluding objection upon that footing. It appears to me that the purchaser in this case, entitled to succeed, and, although not without some hesitation, I think I may also, as in the case of "Hargreaves and Thompson's Contract" (32 Ch. D. 454), order the return of the deposit with interest and the costs of investigation of title.

CHIPS.

Mr. E. A. Ashley, R.A., has been commissioned to paint an altar piece for the American Church in the Avenue de l'Alma, Paris.

The town council of York having applied to the Local Government Board for sanction to borrow £2,845 for the purchase of land for the purposes of street improvement, and also for the approval of the borrowing of £1,400 for the purchase of land in the parish of Water Fulford, in the East Riding of Yorkshire, for the purposes of a lunatic asylum, a Local Government Board inquiry into the application was held on Tuesday in the Guildhall by Col. A. J. Hepper, D.S.O., R.E., Local Government Board inspector.

The rural district council of Chelmsford are about to apply to the Local Government Board for sanction to borrow £10,000 for works of drainage and water supply for Writtle, £10,000 of which is for the drainage scheme, and the rest for the water supply.

At a quarterly meeting of the Beverley Town Council, on Tuesday, Mr. James Gould Smith, of North Beverley, was elected as clerk, and received a salary of £175 per annum out of 107 candidates.

Sir Horatio Lloyd, one of the honorary secretaries of the committee which is carrying out the restoration of the south transept of Chester Cathedral as a memorial to the late Duke of Westminster, and announced that the total cost would be £72,000, and of this £8,718 has been subscribed.

The formal opening of the rebuilt Reulheugh Bridge at Newcastle-on-Tyne took place on Tuesday. The bridge has been rebuilt on the exact site of the old bridge, and is a fine specimen of what it was closed to vehicles, pedestrian traffic has been carried on uninterruptedly during its construction. The new structure was built round about the old bridge, and the old bridge was removed piecemeal. The work of reconstruction has occupied about three years, while the cost has been about £30,000. Messrs. Sandeman and Moncrieff have been acting as the engineers. Mr. George Hantley being the engineer in charge of the work, and the work was carried out by the firm of Sir Wm. Arrol and Co., of Glasgow, of which Mr. A. Higgart is the managing director.

At the last meeting of the City Council for Liverpool an amendment was carried to the recommendation of the Council that the City Council should call a robbing scheme according to official plans, and to accept a tender for £20,680. The amendment called for the consultation of an expert outside the municipality, and the total cost of the proposed alterations should be invited from outside architects.

Our Office Table.

We are glad to be able to report a manifest improvement yesterday in the health of Mr. Alfred Waterhouse, R.A., LL.D. On Monday last week Mr. Waterhouse, who completed his seventy-sixth year, again, as has always been a strenuous worker, was attacked by a paralytic seizure, affecting the left side, and has since been confined to bed at his country residence, Yattondon Court, near Newbury. During the last few days there have been more favourable symptoms, but yesterday (Thursday) Mr. Waterhouse was able to read for a short time, while some tension was manifest in the left arm, so that there is now some reason to hope for a recovery, and even for a return to some extent to professional duties.

MR. LEONARD STOKES, F.R.I.B.A., one of the executors of the late Mr. J. M. Brydon, describes in a letter to the *Thursday's Times* the condition of the drawings left behind by the man who was Government officer in Parliament-street. The drawings then handed over to H.M. Office of Works were, says Mr. Stokes, but incomplete drawings for the carcass of the building. Two-fifths of the fees due to Mr. Brydon on the whole building were paid for these drawings; therefore it may be taken that three-fifths of the work of Mr. Brydon was employed to do remains to be done by someone. For various reasons Mr. Brydon had been instructed to obtain tenders for the carcass only of his building first, leaving all finishing for a second contract; but the drawings for this first contract even were not completed when Mr. Stokes adds that it was practically impossible to complete Mr. Brydon's building without variation from the original design, as enough evidence of his intentions does not exist, so that someone must take up the work, and give the five or six years of constant attention to it which Mr. Brydon would have given had he lived. A number of him, Mr. Stokes says, is a common mistake; but many of them were hurriedly made to help the quantity surveyors to obtain a tender.

The annual report of the progress of the Ordnance Survey up to March 31st last has just been published. It states that during the year 1900-1901 good progress has been made with the various services on which the Ordnance Survey is engaged, but the work has been carried on with great difficulty owing to the absence of nine officers out of an establishment of 24 who have been withdrawn from the Survey for active service in South Africa. The main feature of the work of 1900-1901 has been the augmentation of the Survey staff in Ireland, with a view to the completion of the survey of that country. The revision of the cadastral survey on the 1-2,500 scale has now been taken up of all the counties of England and Wales which were surveyed more than twenty years ago, and the publication of the revised maps is proceeding as rapidly as possible after the completion of the manuscript map. The work on the 1-25 scale has been completed, and the 1-4,950 square miles have been published during the year. In regard to the new series of one-inch maps, the field-work of the revision was begun in 1893, in accordance with the recommendation of the departmental committee. Since that year the whole of England and Wales has been surveyed, and the results are now being published. A marked defect of all the one-inch maps of the United Kingdom which were published before the last few years was that, although they showed unmetalled tracks of all kinds, as well as roads fit for wheeled traffic, they showed no indication between these two classes. The classification of roads which has now been adopted is in four grades. The general result obtained by the revision is that there is available to the public a one-inch outline map of the whole country prepared on a uniform system with its principal details up to date.

The survey and publication of the 1-2,500 maps of the cultivated portions of Scotland were completed in 1893, with the exception of the exception of the counties of Wigton, Kirkcubright, and Edinburgh, Haddington, Fife, and Kinross, and of the Island of Lewis. The plans on this scale of the cultivated portions of those six counties and of Lewis have now been completed and published. The publication of the revised outline map of Scotland is now being completed. In Ireland the survey on the 1-2,500 scale is proceeding. Out of the 10,475 square miles which have been surveyed 1,650 were sur-

veyed during the year 1900-1901. The whole country has been surveyed and the plans are published on the scale of six inches to a mile, while the revision of the Irish one-inch map on the same system as has been followed in Great Britain is in progress. Field revision and drawing are complete; 22,426 square miles have been engraved in outline and 11,837 square miles have been published.

THE Board of Agriculture give publicity to the fact that the arrangements made for the sale of these Ordnance Survey maps through the medium of head post-offices in Great Britain have recently been revised. These maps may be ordered and indexed, inspected at head post-offices in towns where there are no specially accredited agents for their sale. The charge for a single map or sheet ordered through a head post-office will, in addition to the actual cost of the map itself, be in future 3d. instead of 4d., as has hitherto been the case, and an additional 4d. will be charged in respect of each additional map or separate sheet ordered at the same time. On orders for Ordnance Survey maps of the value of 10s. and upwards, no charge to the public will be made beyond the price of the maps themselves.

THE Sub-Property (City Buildings) Committee of the Leeds Corporation had before them, last Friday, the question of providing new law-courts for the town. The chairman of the committee brought forward in October last a report upon the inadequacy of the existing accommodation at the courts provided in the town-hall, and the arrangements made with regard to accommodation in other towns visited by a deputation appointed for the purpose. The report was subsequently discussed at a meeting of the committee, when Alderman Gordon proposed an amendment, that was ultimately adopted, accepting the report, but asking the Property Committee for supplementary information, which, it was suggested, an expert should be called upon to give. Acting upon this recommendation, a sub-committee was appointed last Friday to enquire the services of the Fellow of the Royal Institute of British Architects, who will be required to report on the whole question as to municipal and law-court accommodation in Leeds. Some extensive building scheme is felt to be more or less necessary, for, if the municipal accommodation at the town-hall is to be maintained, the inadequate law-courts must suffer, whilst if the law-courts be extended, the rooms used for municipal purposes must be transferred to the municipal buildings, which would necessitate serious encroachment upon the space now devoted to the art gallery and library.

A CONFERENCE on the housing problem, held in connection with the University Extension Meeting in Oxford, took place last Friday in the afternoon at the Oxford University Club. Mr. M.P. presided, and, in opening the discussion, said overcrowding might be either voluntary or involuntary. The involuntary overcrowding arose really from economic causes which they could not hope to do away with altogether. The difficulty of solving the problem had been much increased by the fact that the sanitary laws, which were administered by officials often without sufficient discretion, and secondly, from the enormous rise in the price of labour and building materials, so that now they could not provide the ordinary tenement room for less than £80 or £90 in London. The restrictions imposed by the Building Acts, which they first say the sanitary laws, which were administered by officials often without sufficient discretion, and secondly, from the enormous rise in the price of labour and building materials, so that now they could not provide the ordinary tenement room for less than £80 or £90 in London. The restrictions imposed by the Building Acts, which they first say the sanitary laws, which were administered by officials often without sufficient discretion, and secondly, from the enormous rise in the price of labour and building materials, so that now they could not provide the ordinary tenement room for less than £80 or £90 in London.

UNDER the direction of the Mercers' Company and the Gresham Committee Messrs. W. Cubitt and Co. are preparing a panel in the south-east corner of the interior of the Victoria and Albert Museum for the reception of the work of Mr. Edwin A. Abbey, R.A., which is a commission from the Skinners' and Merchant Taylors' Companies, and

commemorates the founding of their annual feast. In the reign of Richard the Third there occurred a dispute between the companies as to which should take precedence at civil functions. Lord Mayor Hillesden (1485) decreed that they should enjoy precedence in alternate years, and should dine together in token of amity on the eve of St. John's Day, June 24. It is expected that Mr. Abbey's picture and that of Mr. Frank Brangwyn, "Modern Commerce," will be unveiled by the Lord Mayor before his term of office expires.

MANORIAL residences are still to be bought within a reasonable distance of London. At Colchester, on the site of St. Clare's Hall, a picturesque old moated manor house, with 450 acres of land, to say nothing of duck and snipe shooting, is to be offered by Messrs. Spurling and Sons. The property is situated at St. Osyth, four miles from Clacton. Another ancient manorial residence is Ballingdon House, the borders of Essex and Suffolk, which Messrs. Wheeler and Son will sell at Sudbury on Aug. 29. This historical and interesting house, which is of fine old brick and timber construction, was built by Sir Thomas Eden, about 1593. "Here," as Fuller says in his "Worthies of England," "his name and famous reputation for his shipbuilding, and took a leading part in the affairs of both Suffolk and Essex." This was the house in which the Earl of Essex resided when he was banished from the Elizabethan Court.

To the disappointment of archaeologists and all visitors to the Roman wall of Hadrian, in Northumberland, orders have been issued by the proprietor that Bercovicus, or Hoststeads, shall henceforth lie closed to the public. This is purely in self-defence. It has been found that certain young men, on Sunday especially, have amused themselves in heaving the stones from the walls of the station down a neighbouring ravine, and otherwise defacing this, which is one of the most interesting stations on the wall. It contains an area of about five acres, in the form of a parallelogram, rounded at the corners. It stands on a shelf of basalt, and slopes to the south. The usual method of approach is by the Newcastle and Carlisle Railway to Hayden Bridge, a distance of five miles up hill. There are guard-chambers on each side of the entrance gates, one of which was of wood, and the other of stone, and in which in 1832 nearly a cartload of coal was found. The stone against which the gate struck still remains, while there is a rut, about 8in. deep, in the stone on the threshold of the gateway, evidently caused by the action of wheels. The fine station at the Chesters, near Chollerford, with the museum of Roman remains, is shown by the caretaker, Mr. Tailford, on Saturday and Tuesday, and Bank Holidays. The museum of Roman relics at Chesters is closed at present, as the place is being rearranged.

THE 16th-century oak panelling and carved overmantel have just been removed from the house in Fore-street, Ipswich, once the residence of one John Eldred, a mariner, who accompanied the great discoverer, Captain Thomas Cavendish, on his voyage round the world in 1586-92. The oak panelling, which is said to have formed part of the cabin of Eldred's ship, has now been found to have been placed over some very fine fresco painting in black and white, which had formed the ornamentation previous to the panelling. The design is a good one, and is beautifully worked out. Much of it was, of course, damaged by the studs placed to carry the oak panelling, but one portion, measuring about 7ft. by 3ft. 6in., is in a perfect state of preservation. The owner of the cottage, Mr. John Dupuis Cobbold, of Holywell, Ipswich, has offered the fresco to the Ipswich Museum, and a careful attempt is being made to remove it intact.

MR. F. HAVFIELD, of Christ Church, Oxford, describes two excavations of Romano-British sites now in progress—the one at Gelligill, 13 miles north of Cardiff; the other at Caerwent, near Chepstow. The Cardiff Naturalists' Society is uncovering a Roman site, a ring at Gelligill, part of a system of forts and roads, constructed very early in the Roman period, perhaps under Vespasian, to coerce the wild hillmen of the district, the Silures. It is small in area, about four acres, and roughly built of intractable local stone. But its foundations are singularly perfect, and it is a complete ruin. In the centre, the so-called "prætorium," the official headquarters, a square block of rooms and colonnade round two tiny courts. To the north of this is a building with a small central court, possibly the

commandant's dwelling, and beyond that an oblong battlemented building, with floors raised above the damp, which may have been a store-house. A similar building stood on the other side of the headquarters, and these four buildings reach across the fort from north to south. East and west of them, filling the two ends of the fort, are long ranges of building, once, perhaps, partitioned by woodwork and serving as barracks. Round the whole is the rampart, a solid curtain wall, 12 ft. high on both sides, with stone-work crenelated, on the other hand, says Mr. Haverfield, a little, walled country town inhabited by civilised Romano-Britons. Its walls still stand in stately fragments; its north gate, lately uncovered, is an imposing portal. Within are houses, floored in with mosaic, and warmed by hypocausts. It was a small place, almost on the edge of Romano-British civilisation.

SOME months ago, in the course of the demolition of an old house for certain extension works at Messrs. Strong and Co.'s Brewery at Romsey, a fresco was discovered on the wall of one of the rooms, covered up by some of the old wall-papers. It apparently was a coat of arms referring to Queen Elizabeth, for at the head were the letters "E.R." inclosing a Golden Crown. In the centre is a shield with the Garter motto "Honi soit qui mal y pense," and underneath a lion with the crown. The supporters of the shield are a crowned lion and a wyvern, both rampant, and under the whole is some floriated work, including what was supposed to be intended to represent the Tudor Rose. The relic was somewhat broken, but it was carefully removed, and was taken to Mr. S. J. Wiseman, of Above Bar, Southampton, who has placed it together, and mounted and restored the whole, and inclosed it in a massive oak frame made from some of the wooden beams of the ancient house where the discovery was made.

A REPORT on lead compounds in pottery to the Home Office by Professor Thorpe, Principal of the Government Laboratory, was issued on Thursday week. It is of considerable length, and deals with 1) The proposed Special Rules I. and II.; 2) the composition and solubility of lead frits; 3) the influence of grinding on the solubility of lead frits. It is now clear that no more precise data than the fritting of lead shall be made compulsory, and, further, that every fritt shall conform to a certain standard of solubility in dilute hydrochloric acid. The manufacturers have proposed an amendment to Rule I. to the effect that the words "with some silicious substance" should be added after the words "fritted." Dr. Thorpe argues that this addition, unless amplified and rendered more precise, would permit of a merely nominal fritting which might amount to a practical evasion of the rule. The real point of dispute, however, is Rule II. to which the manufacturers object in toto. Its object is to make Rule I. really effective. Mere fritting is no safeguard against lead-poisoning, as the lead contained in the fritt may be readily absorbed. It is assumed that this is not the case if the compound is insoluble in dilute hydrochloric acid, which is the standard test. But gastric juice, and it is further inferred that the less soluble the fritt the more harmless it is. The Home Office, therefore, on the advice of Professor Thorpe, has fixed on a maximum standard of solubility to be calculated on a given formula. Professor Thorpe states his own opinion on the fact that certain manufacturers produce ware with glazes conforming to the standard, and that some specimens sent him by English manufacturers for examination also conform to it.

ON Saturday, at the Free Library, William Brown-street, Liverpool, a public distribution of plumbers' registration certificates took place under the auspices of the district council of West Lancashire, (Cheshire and North Wales), and in association with the National Registration of Plumbers in connection with the Worshipful Company of Plumbers, London. The chair was occupied by Dr. Vacher, medical officer of health for Cheshire. Mr. William Hind, Mayor of Stockport, presided, and the ceremony was attended by about 1,200 persons in connection with the Plumbers' Company, which held during the past three years some 225,000 more in this position than it had received. He moved a resolution pledging the meeting to further press the matter of compulsory registration upon the attention of the Government, and that these to

legislation in the next session of Parliament. The motion was seconded by Mr. T. Fallows, J.P., supported by Mr. Hurdare and Mr. Owen, respectively, and carried unanimously. One hundred and ninety certificates of registration as sanitary plumbers were presented to masters and operatives as the results of examinations recently held in Liverpool, West Lancashire, Cheshire, and North Wales.

COMPRESSOR air supplied to offices is a feature of the Rose Building, a large office building recently erected in Liverpool. The feature is a provision, it may be said, being intended as an attraction to physicians and dentists. A 6in. by 8in. by 8in. Marsh compressor, operated to maintain a pressure of 40lb. to the square inch, and a pressure tank, 3ft. in diameter and 8ft. high, are located in the basement, and a 2in. main is carried round the basement supplying a number of 1½in. risers. Branches are taken from these under the wood floors, and a ½in. pipe carried to an outlet in each room at the chair-rail. A similar system of piping, only of larger sizes, has also been adopted for supplying the main drains for mechanical purposes, the illumination of the building being electric, and the heating by steam. The gas outlets are at the floor to distinguish them from the air outlets, which are at the chair-rail, as stated.

MR. JOHN HART, Maltravers House, Arundel-street, Strand, wishes to remind all interested of the approach of the time for sending in the list of loans to the Ecclesiastical Art Exhibition in connection with the Church Congress. He will be very glad to hear at once from any who intend to assist the exhibition by the loan of articles of interest. The collection will, as before, embrace every kind of gold and silver smiths' work, metal work, tapestry, needlework, carvings in wood and ivory, MSS., paintings, and articles of ecclesiastical and archaeological interest. For church plate and embroidery he is always particularly grateful.

THE first International Exhibition of Modern Decorative Art will be held in Turin next spring under the patronage of the King of Italy and with the assistance of the socialist Government of France throughout the world. Mr. Walter Crane has accepted the office of English commissary, and promises to the general committee a collection of the best works of contemporary British artists, together with a retrospective exhibit of the work of the English modern style. As regards the local section, Mr. Francis Newbery, director of the local school of art, promises contributions by Glasgow decorative artists. Other nations represented will be France, Belgium, Austria, Hungary, Russia, Denmark, Norway, Sweden, the United States, and Japan. Further information may be obtained from the general committee of the exhibition in Turin.

NOTHING is sacred to the sapper nor to the American engineer, but, fortunately, pecuniary conditions will deprive the latest project, that for "improving" the Falls of Niagara, of the remotest chance of realisation. A Mr. Joseph F. Keefe has actually submitted to the Niagara Falls City Council a plan to cut a section of Goat Island, build an abutment, and "connect the American and Canadian Falls into one grand torrent of water." "My idea," says Mr. Keefe, "is to build a great giant wall or abutment, with a stone top or coping, that cannot be washed away, and let the water from both sides of the island gravely slide over the dam or stone esplanade, thus making one continuous stream of pure white water from the jut of one shore to the jut of the other."

THE reopening of Stoke Bruerne Parish Church, after internal restoration, took place on Wednesday. A baptistry has been formed in the west bay of the south aisle in memory of the late Mr. George Savage. The total cost has been about £370, and the parish schools have also recently been enlarged at a cost of £100.

THE Society for the Protection of Ancient Buildings has been interesting itself in the repair of St. Andrew's, Coventry, now in progress. After correspondence with the local authorities, arrangements were made for the visit of two representatives of the society, Mr. Oliver Baker and Mr. C. E. Butcher. The report of these gentlemen has been adopted by the society, and is generally favourable to the scheme of the work of repair which is being carried out, although some minor details, such as the carving of a new corbel in an ancient kitchen, are criticised.

THE ARCHITECTURAL ASSOCIATION.

AGUSTINE—PITTS—MILNER VISIT TO PRESBYTERIAN CHURCH, Cambridge, 15. AGUSTINE, Mr. J. H. Hare, P.O. Box 60, to be sent to Mr. R. D. CLAPHAM, 10, St. James's Place, N. 1, not later than AUGUST 22nd. Members to meet in the Main Lane Bookshop Office, G.R.R., Liverpool-street, at 8.45 for the 10.15 train to Cambridge. R. S. BALFOUR, 1, Ross Street, N. P. G. MAULE, 1, Ross Street.

CHIPS.

The corporation of Lincoln recently invited tenders for large water borings near the city for the purpose of obtaining an additional supply of water. The tender of Messrs. Charles Chapman and Sons, Salford, amounting to £14,605 for a boring 216ft. deep, has been accepted. The water is to be delivered in Liverpool at 10d. per foot, where Scottish granite now sells at 2½dols.

The Bishop of Shrewsbury laid the foundation-stone of St. Mary's Roman Catholic Church, Litchford, Warrington, on Sunday. The new church will seat 600 persons.

Mr. W. A. Ducat, one of the Inspectors of the Local Government Board, conducted an inquiry on Wednesday week at the Town Hall, Maidstone, into the application of the provisions of the Act for the better regulation of the borrowing of money for purposes of street improvement and stable accommodation. The town clerk, Mr. Herbert Monckton, and the borough surveyor, Mr. T. F. Bunting, explained the proposals, to which no opposition was offered.

The contractors for the Scarborough Marine Drive, whose time for the completion of the contracts, it is stated, has expired, have written to the Marine Drive sub-committee, denying the accuracy of the residents' figures, and contending that the extra time allowed for stress of weather, &c., has not expired. They also question the right of the corporation to make deductions owing to the contract not being completed. In addition, they state that they are of opinion that the suspension of their certificates is contrary to the conditions of the contract.

His Majesty King Edward VII. has been graciously pleased by Royal Warrant to appoint Messrs. Geo. Jackson and Sons, of 49, Rathbone-place, London, W., decorators in relief to His Majesty. Messrs. Geo. Jackson and Sons have had Royal Warrants granted to them by three previous sovereigns: George IV., William IV., and Victoria.

Lady Algernon Gordon-Lennox has made some interesting architectural discoveries at Broughton Castle, near Banbury. In removing the plaster from the walls of the great hall five or six Early 14th-century windows were actually revealed, which have been blocked up since 1554. Some very fine windows of the 14th-century period have also been disclosed, one of them still showing tracery. Mr. C. Purdon Clarke, C.B., R.E., of the Victoria and Albert Museum, has been to the castle to give his opinion on these noteworthy finds.

The Clay Cross Urban District Council have accepted a scheme of sewage disposal for their urban district prepared by Mr. Harry W. T. Taylor, A.M.I.C.E., of Newcastle-upon-Tyne and Birmingham. The sewage will be treated biologically, the cost being £6,000.

The late Mr. Henry Edward Burgess, solicitor, of Queensberry-place, and of New-square, who recently died, left personal estate of the net value of £347,000. His will, which was proved by the churchwardens of St. Mary, Outlands, Weybridge, £2,500 for the erection of a tower to the church of St. Mary, in memory of the late Mr. George Thomas Woodcock.

By command of the King, a sale was held on Wednesday at Ascot Racecourse, of the whole of the buildings on the course (with the exception of the Grand Stand, which is the property of the trustees, on a lease from the Crown), comprising the Royal Stand, Master of the Buckhounds Stand, and Press Stand, Jockey Club Stand, and the buildings and stabling of the Royal horses and carriages. The principal sums were: Master of Buckhounds Stand, £28,000; Jockey Club Stand, £10,000. The total sum realised was £217,581, for buildings which, the auctioneer said, would cost £10,000 to replace, and modernise in six months. The new structures are to be proceeded with immediately.

In the House of Commons, on Wednesday, the Lords' Amendments to the London County Council (Tramways and Street Widening) Bill and the London County Council (General Powers) Bill were agreed to.

A water-excluding preparation called "cement coating," which has been used for some years in a number of American cities, is composed of Portland cement and a special fluid for brush-work on brick walls, and of the same materials and sand for plaster.

LIST OF COMPETITIONS OPEN

Zealand - Alterations to Church			The Rev. T. Houghton, Ecclestone Vicarage, Sheffield	Aug. 31
Penzance - Laying-out Ground on Western Promenade	£21 merged, £10 10s.		T. H. Cornish, Town Clerk, Public Buildings, Penzance	Sept. 1
Blackpool - Laying-out Land at Cemetery	£24, £15, £5.		The Borough Surveyor, Town Hall, Blackpool	Sept. 16
Blackpool - Public Buildings, Fire Station, &c.	10s. merged, 50s., 3s. 6d.		The Public Works Committee Office, 171, King-st., Chelsea, S.W., Oct. 1	23
Camberwell, S.E. - Baths and Washhouses, Old Kent-road	150s., 75s., 50s.		The Town Clerk, Town Hall, Camberwell, S.E.	23
A. Saxton Snell, F.R.I.B.A., Assessor				
London, N.W. - House of the Oak Society's New Offices, &c.,	£100 merged, £75, £50		Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, Adelphi, W.C. Nov. 13	
Easton-road limit £450			The Rev. G. E. Loe, Rector, St. Peter Port, Guernsey	
St. Peter Port, Guernsey - School 750 places			P. H. Webb, T.D.C., 10, Colchester Walkover Street, Thomas Evans, 102, Cathedral-road, Cardiff	
Malpas - Public Buildings, Fire Station, &c.	£23, £20, £10 merged			
Cardiff - Chapel, Cathedral-road - cost £5,000				

LIST OF TENDERS OPEN.

BUILDINGS.

Seaborough - Alterations to Royal Sea-bathing Infirmary	County School Governors	D. M. Jenkins, Architect, Gwyn Hall, Neath, Wales	Aug. 17
Winclet - Additions to Children's Hospital, Rothwell Road, London, E.	Guardians	C. E. Eason, Architect, Huntmore-row, Seaborough	17
Wroughton - Rebuilding Three Horseless Hous	Howard Horsell	W. F. Dyson, Secretary, Barking-road, W.	17
Kingsbridge - Stands, &c.	Agricultural Society	W. Drew and Sons, M. S. A., Architects, 29, Egmont-circus, Swindon	17
Rimphrey - Dated House	Urban District Council	W. Harvey, Cornwall, W.	17
Waltham - Farm-house, Card Shaft, Cottage, &c.	Most Rev. Dr. O'Donerty	William A. Jarvis, Secretary, 3, Strandridge, Kingsbridge	17
Penkridge - Improvements to tortoise-shell House	Hoyle, Nether School Board	S. Jackson and Son, Architects, Tanfield Chambers, Bradford	17
Londonderry - Five Houses at Hogg's Folly	Gr. Northern (Ireland) Railway Co.	J. Jenkins, Architects, 1, Grosvenor-place, W.	17
Hoyle - Alterations to School	School Board	T. Elliott, 37, Darling-street, Enniskillen	17
Brimscombe - Mission-Room at Hyde Station	W. Wyn Evans	E. J. Tye, Architect, Strand, Londonderry	17
Clun - Improvements at Manse	Headmaster Committee	W. J. Bykes, Architect, Hoyle, near Barnsley	17
Whitechurch - School	Kinsale County Council	G. P. Milnes, Architect, Town Hall, Stroud	17
Worcester - Town Hall, &c.	The Rising Sun Public House	The Company's Engineer-in-Chief, Alderson-street, Dublin	17
Holywell Green - Blocks of Conventines	Urban District Council	D. and J. B. McMillan, Architects, 211, Union-street, Aberdeen	17
Penkridge Road - Two-storied School, Meyrick-street	School Board	E. & S. Williams, Architects, Borough Chambers, Wharfedale, Cardiff	17
Widford - Mill	Widford and Eton Mill Cake Co., Ltd.	George Howard, Architects, 1, Grosvenor-place, W.	17
Gr. Northern (Ireland) Railway Co.	Gr. Northern (Ireland) Railway Co.	W. Clement Williams, Architect, 23, Southgate, Halifax	17
West Down - Caretaker's House	School Board	G. Morgan and Son, Architect, 21, King-street, Carnarvon	17
Ridley - Mill School	Trustees	W. Wells and E. Jones, Architects, 1, Grosvenor-place, Hull	17
Hoyle - Primitive Methodist Chapel	London County Council	J. Cartwright, Peck Chambers, Market-place, Bury	17
Abertillery - Tenement House at Springfield	W. Wyn Evans	W. Lawrence and Sons, Architects, 1, Grosvenor-place, W.	17
Barrow, Ireland - Repairs to Old Abbey Church	Headmaster Committee	Walter J. Bykes, Architect, Hoyle, near Barnsley	17
New Bromborough - House	Kinsale County Council	The Architect's Department, 18, Falmouth-street, Aberdeen	17
Bristol - Disinfecting Station, Federer-road	W. Wyn Evans	Henry Seaver, C.E., 128, Royal-exchange, Belfast	17
Stowenham, N.B. - Fever Hospital	Headmaster Committee	Lawrie and Moss, Architects, 1, Grosvenor-place, W.	17
Barrow - Four-storied School	Kinsale County Council	T. H. Yabbiom, M.I.C.E., City Engineer, 63, Queen-square, Bristol	17
Hunstanton - Purifying-House	Urban District Council	Brown and Watt, Architects, 11, Union-terrace, Aberdeen	17
Batley - Electricity Works	Corporation	Lacey, Cliregh, and Sillar, Engineers, 2, Queen Anne's-gate, S.W.	17
Barrow - Town House and Ship	Corporation	B. Lindford, Architects, 2, Queen Anne's-gate, S.W.	17
Rochester - Culman's Shelter	Corporation	W. Banks, A.M.I.C.E., City Surveyor, Guildhall, Rochester	17
Appin - Waterfall - Schools	Sisters of Mercy	Samuel F. Hydes, F.R.I.D.A., 21, South Mall, Cork	17
Kilrush - Addition Warle at Workhouse	Guardians	H. G. F. Fisher, Barrister-at-Law, 1, Grosvenor-place, W.	17
North - Extensions to Wyndham Constitutional Club	Wyndham Urban District Council	H. H. Childs, 69, Glynne-road, Porth, Wales	17
Bringington - Town House and Redding-house	J. Burrell	J. Thomas, Engineer, Cymmer-road, S.W.O., Glam.	17
Blackburn - Chimney and Buildings, Throstle-street	School Board	J. Earnshaw, Architects, Carlton House, Bridlington	17
Stratford-upon-Avon - Porter's Lodge, &c., at Hospital	Stratford-upon-Avon Municipal Council	J. H. Beckett, Architect, Stratford-street, Longton, Staffs.	17
Llanelli - Alterations to St. Paul's Church	Rev. A. B. Williams, M.A.	Wm. Stubbs, A.M.I.C.E., Boro' Eng., Municipal Offices, Blackburn	17
Woking - New Shop in the Arcade	Rev. A. B. Williams, M.A.	Robert Dixon, Architect, Sheep-street, Stratford-upon-Avon	17
Bristol - Corner of Court and Mortuary, Quakers' Friars	Southdown & Chapman Guardians	W. Goodwin and Co., Architects, 1, Falmouth-street, W.	17
Derbyshire, E.E. - Block of Dwellings, Swan-lane	Southern Co-operative Co.	W. Griffiths, Architect, Falcon Chambers, Llanelli	17
Three Workmen's Dwellings	Town Council	R. G. Wilson, Architect, 181, Union-street, Aberdeen	17
Black - Bottle-Washing Shed and Stores at Distillery	London County Council	H. S. Shaw, Architects, 1, Grosvenor-place, W.	17
North - Electric Light Station, Charles-street	Town Council	T. H. Yabbiom, M.I.C.E., City Eng., 63, Queen-square, Bristol	17
Blackburn - Alterations to North Head Inn	Urban District Council	The Borough Surveyor's Office, Town Hall, Luton	17
Abertillery - Additions to Silweb Independent Chapel	Corporation	The Borough Surveyor's Office, Town Hall, Luton	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	Arthur W. Vennart, M.S.A., Architect, Chard	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	B. Ball, A.M.I.C.E., Borough Engineer, Town Hall, Nelson	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	Henry Hobart, Architect, 1, Grosvenor-place, W.	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	Herbert Shaw, A.M.I.C.E., 7, Cranbrook-road, Hford	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	H. H. Shaw, Borough Surveyor, Town Hall, Hove	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	C. Brownrigg, A.M.I.C.E., Boro' Eng., Town Hall, Birkenhead	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	Edwin T. Hall, F.R.I.B.A., 54, Bedford-square, W.C.	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	F. E. Chambers, Architect, Clifton-gardens, Gloucester	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	John Bowen, A.M.I.C.E., Borough Engineer, Town Hall, Reading	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	F. E. N. Haswell, F.R.I.B.A., Tynestreet, North Shields	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	John Lockwood and Sons, Log Cabin, Newcastle-on-Tyne	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	J. Cresswell, County Architect, Mould, Newcastle-on-Tyne	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	T. Duncombe Mann, Clerk, Embankment, E.C.	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	A. J. Wood, Architect, 22, Surrey-st., Victoria Embankment, W.C. Sept.	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	W. J. Rowell, Architect, Market-place, Boston, Lincs	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	The Office of Public Works, Dublin	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	E. T. Laurence, Architect, 1, Buckingham-st., Adelphi, W.C.	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	The City Engineer, Municipal Buildings, Leeds	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	J. Owen, Architect, Menai Bridge	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	The Surveyor's Department, Town Hall, Paddington, W.	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	John Smith, Architect, Montreal	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	T. Holliday Richardson, Architect, Hemsworth, near Wakefield	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	John Launde, Builder, 70, Westcot-street, Edinburgh	17
Walsall - Municipal Offices and Town Hall, Lichfield-street	Corporation	John Glenn, Engineer, 11, Queen Victoria-street, E.C.	17

Charlotte Union Circulans

Charlotte Union Circulans

D. S. Bloomfield, Clerk, Union Offices, All Saints', Manchester ..	Aug. 27
N. Walton, Secretary, Town Hall, Alston ..	" 27
J. W. Ashton, Chapel-street, Inkipfield ..	" 27

J. Haggas and Sons, Architects, North-street, Keighley	Aug. 17
Jenkins and Marr, Architects, 16, Bridge-street, Aberdeen	" 25
Alex. Hellard, Town Clerk, Town Hall, Portsmouth	" 21

Urban District Council .

Urban District Council .

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The Urban District Council

The Urban District Council

J. E. Barry, Surveyor, Silver-street, Spennymore.	Aug.
J. V. Birch, Clerk, 93, Castle-street, Ayrshire.	
C. Crook, City Engineer, Glasgow.	
Wm. Stables, M.I.C.E., Barrington, Municipal Offices, Blackburn.	
W. Clement Williams, Architect, 28, Southgate, Halifax.	
J. C. Ingleton, Civil Engineer, 64, Cochrane-terrace, Glasgow.	
Fras. Trusdell, Clerk, Truro.	
A. A. Kolkewicz, Architect, 78, Chamber Temple, Strand, W.C.	
The City Engineer, City of Glasgow.	
Thos. W. Lethbridge, Bromley Cross, near Bolton.	
Warren and Stuart, Civil Engineers, 49, Hope-street, Glasgow.	
R. E. W. Berrington, Engineer, Bank Buildings, Glasgow.	
H. H. Houlden, Engineer, 10, Victoria Road, London.	
A. J. Hinchcliffe, Architect, 14, Regent-street, Barnsley.	
John Chadwick, Engineer, Bletchley.	
W. Wilkinson, Surveyor, Nance, Winsford.	
A. A. Kolkewicz, Architect, 18, Chamber Temple, Strand, W.C.	
W. H. Radford, C.E., Albion Chambers, Nottingham.	
W. H. Radford, C.E., 10, Victoria Road, Warrington, Reading.	
W. L. Douglas, C.E., Clydesdale-street, Hamilton.	Sept.
W. A. Baird Laing, C.E., 13, George-street, Edinburgh.	
V. Van der Graaf, M.A., 10, Victoria Road, Warrington.	
The Engineer's Department, County Hall, Spring Garden, S.W.	Oct.

Urban District Council .

Urban District Council .

H. W. Longdin, Surveyor, Town Hall, Ankerly, S.E.	Aug.
And. Ferrier, Clerk, Castle-street, Edinburgh	"
H. W. Longdin, Surveyor, Town Hall, Ankerly, S.E.	"
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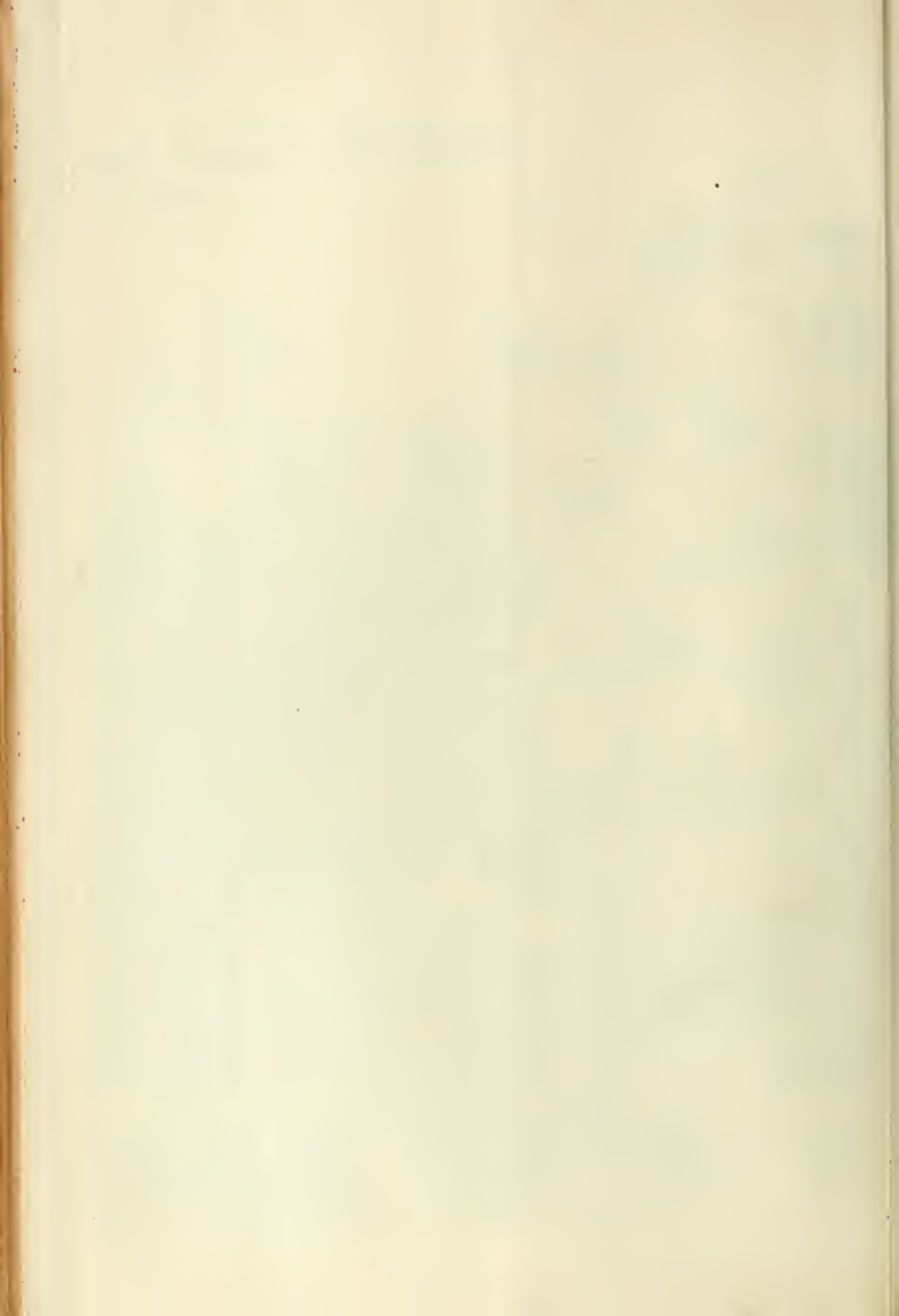
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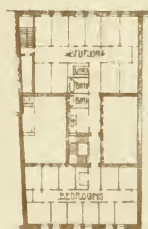




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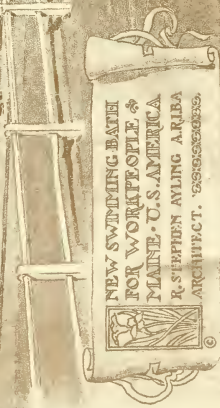


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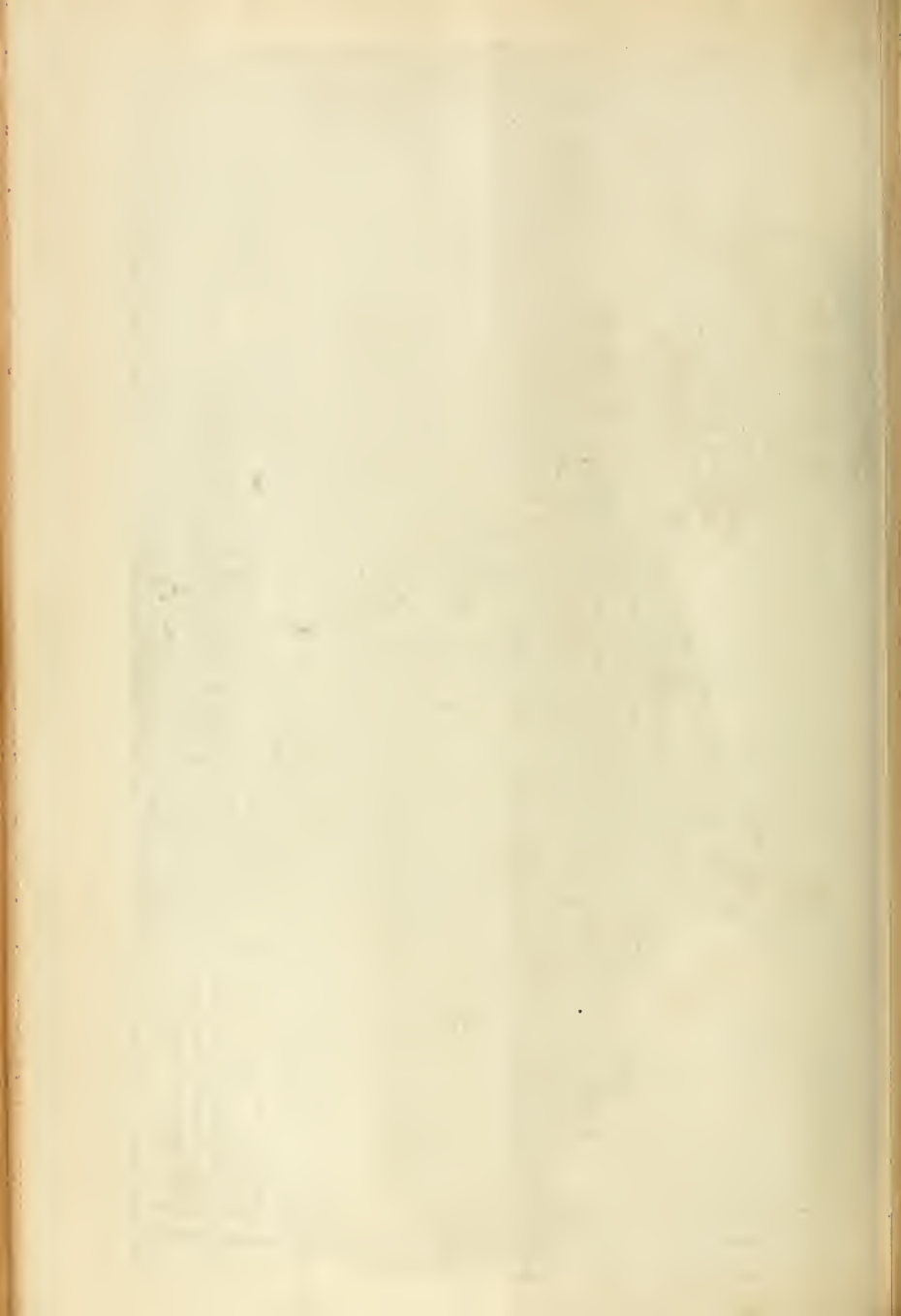


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ART IN FIXTURES AND FITTINGS.

WHETHER, in the design of a building, the architect should take into account those fixtures and appointments which have a definite relation to the use of the structure, or prepare his plans independently of them, is a question of moment. Put in another form, should a building be designed to adapt itself to the fittings, or the fittings be made to suit the building? Such things as seats and desks, benches, bookcases and tables, counters, &c., are fittings that have a definite purpose to fulfil in a building. They have to be made to certain sizes, and, therefore, to a large extent the building ought to be planned to receive them. Thus, in the fitting up of a schoolroom or classroom, the seats and desks have to occupy a certain area. They cannot be crowded into a less space without great inconvenience, and the allotment of seating and desk-room ought to be considered before the plans are finished.

A public hall or concert-room to accommodate a certain number of people must be planned so as to provide for an area large enough for the purpose, in addition to space for lobbies, corridors, platform or orchestra. The area so required must be calculated from certain data, and if one of the dimensions of the plan is fixed—say, the length—the other dimension or width will be ascertained by dividing the calculated area by the known dimension or length. So also in the planning and design of hospitals and infirmaries, asylums, and like buildings; where a certain unit of accommodation—the bed—has to be considered, the given space per patient must be allowed. In all these instances, therefore, the architect has practically to design his building for his fittings; and to proceed in the contrary way would be to court failure and to introduce all kinds of difficulties after the plans are prepared. How often are the plans of new churches, schools, and hospitals sent back for revision by the church building societies, the Education Board, and the Local Government Board respectively! On the other hand, there are several classes of structure which are not so bound by the units of accommodation or the number of persons who are likely to enter them. Of these we may name domestic buildings, offices, commercial buildings, hotels. Over these there are fewer restrictions, and the architect not being hampered by any regard for seat room and bed space, is able to design his work with more freedom. But even in these there are certain fixtures to provide for—such as doors and windows, fireplaces, staircases and lifts, culinary fittings, closets and cupboards, pantries to say nothing of sanitary and plumbing fittings, hot-water apparatus, lighting, &c. The ordinary architect will say all these things are part and parcel of the duties of the business, that they are of no great importance, and do not affect the design at all. Many of them can be supplied and fixed by firms who undertake all the responsibility and risk attending them. But this is not the position the man of true architectural convictions can hold. As vital to the functions of his design as organic parts of the structure, he regards them quite as important as any other portion of his design, and it is well this view should be taken before the question we have placed at the beginning can be conscientiously answered. Our leading men unquestionably regard the fixtures and details of their buildings with as great an earnestness as they are capable of

showing. Men like Pugin, Sedding, Burgess, and Street, to name only a few that have passed away, have been quite as intent on a church bench, a lectern, a gas-bracket, or an iron railing, or even a fender or coal-scuttle, as they have been on the design of a tower or a gable-end. The smallest detail, even the twist of a bar of a wrought-iron grille, would not have escaped any one of those masters of art craft. They held as an article of their creed their belief in the universality of art, and its permeating effects—that a building must have an intimate relation with the smallest detail; and it is only this view of architecture that is now accepted by any honest exponent. Of the majority, it may be said fairly that they think an architect's work is independent, and they regard a building as a playground for the various trades to advertise their goods or air their crotchets. In looking over and carefully examining the ordinary building of recent construction, we find abundant evidence of this latter view. Amongst this large class of designers there are some who are so honestly impressed with the idea of the dignity of architecture as a professional calling, that they think it almost below their position to bestow any attention on fittings and questions of detail. This is an opinion that prevailed in the earlier part of the last century, when large public buildings were erected, of exceeding bareness and poverty within, when such things as furniture and decoration were considered almost beneath the architect's attention. So transcendent a view of architecture favoured the ambition of professors who had never given any time or attention to arts outside their own. To them architecture was confined to the design of buildings of classic or Gothic proportions of a more or less monumental kind, whose interiors were often quite bare. But art at this period had not begun to influence the interior fittings or decoration. We have men of this strictly architectonic type now, who confine their attention to the structure, and leave all the fixtures, fittings, and furniture to tradesmen and experts. The consequence of this procedure is that buildings are designed quite independently of all interior requirements. Rooms are planned without the necessary wall-space for chairs or other furniture, disregarding the dimensions of tables or desks, bookcases, beds, and other necessary articles of furniture. The fittings and furniture have to be made to fit the rooms, and not the rooms to the fittings. But it is argued that by this independent mode of planning the architectural effect is studied, the position of columns, of doors and windows, fireplace, and other features are duly observed and arranged, which it would be impossible to do if the room was planned to fit the furniture. Those who think the two classes of art should be kept distinct—that the designer of the structure should have nothing to do with furniture and decoration, have not yet disappeared. Many of them imagine there is something quite contradictory and incongruous for an architect to practise in both capacities; but this is a mistaken view of the subject and was never known in the earlier ages. The incongruity and want of agreement between the architects' and the manufacturers' or the tradesmen's work, furnish the strongest arguments for a better agreement between the designer of the building and the manufacturer or tradesman who complete and perfect the interior. There is an inclination in some quarters to leave all constructional iron or steelwork to the engineer; but we are not sure that this will be for the good of the art. Whenever an architect has prepared the design and details in conjunction with the iron-merchant or contractor, and they have put their heads together to meet little requirements of design, the work has been the better for it. We shall, of course, be met with the argument for specialism;—that archi-

ects should keep to their own art and business, and allow engineers and other tradesmen to do their own special work in their own way without interference. But, as we have before said, all formative art—the art of design—is exempt from a process which applies chiefly to the mechanical arts. We should have no coherent design if the principle of letting each tradesman design his own work independently of the architect was strictly followed. Specialism has gained a victory over men of the kind we are describing. They have handed over whole branches of their art to those who are mainly manufacturers, but have not learnt anything of art except how to make it pay. For we must remember it is not now as it once was, when every tradesman belonged to a guild which inculcated certain traditional rules; then the "master builder" or architect could entrust his metal and woodwork to the nearest craftsmen with perfect confidence. We must discern, therefore, the wide difference between the old and present conditions. The architect who delegates to others all within the bare shell of the building does not at some risk. The contractor who undertakes the joinery or plastering or ironwork does so to make the work pay, not because they will be done up to the required standard. It is indeed "specialism," but of another colour; it means only subdivision of labour for the sake of profit. No doubt the work is done more expeditiously—the joinery, for example, is machine made or imported; but the details are so cut down that the architect hardly knows them—possibly they have not been worked to any drawing. Under a co-operative system other results may be achieved, but the contractor is not always the model employer; his first idea is that of profit or a dividend. If the workmen engaged were provided with materials at cost price, we might expect more solid and satisfactory work; but under a commercial system, into which the competitive principle enters, it is impossible. To take a door—probably one of the commonest items of joinery—we see many devices to cheapen the labour, such as the applied moulding, instead of the Medieval plan of cutting it on the edge of the framing, and it is rarely rebated to fit into a groove, as in a good class of joinery. The "planted" mouldings are produced by machinery at almost the cost of the material. On the other hand, the moulded door, cut out of the solid, requires labour in stopping or mitring the moulded edge. Then on the older doors we find the panels narrow—not more than 10in.; but the contract-made door has invariably wide panels and narrow stiles. The old two-panelled door, with panels of 2ft. 6in. wide, could not be produced now, as the wood is often too ill-seasoned to stand any wear. Besides the construction and solidity of the earlier doors, they were made to fit the rebates, which is more than can be said for half the doors turned out by modern contracting firms. We may say something about the hanging of doors of modern buildings, which is often so imperfect that the door does not hang true or close upon the rebate of the frame. This is often the fault of badly-made hinges, or their fixing to the frame. The earlier and more accurate way of hanging a door was by pivots. These could not be used for rebated openings, but only for face-hung doors. The transformation or evolution which resulted in the modern door butt hinge was a great one. It is a pity, for the credit of modern architectural fittings, that so concealed a contrivance was invented. The simple strap hinge of the Middle Age type was at least a strong and artistic hinge as it strengthened the door, and was made by the metal-worker as a decorative feature as well. The modern 19th-century butt is one of those concealed devices for hanging doors which appealed to the taste of the Classic revivalist: it allowed the panelling of the door to be seen intact,

while it favoured the related frame. It is undoubtedly one of the most artistic fittings we have, besides being extremely unscientific and weak, as the weight and strain of the door depends on the resistance of about half a dozen screws held to the jamb lining and to the edge of door. On the other hand, it is one of these things that has reduced labour: it is cheap for the contracting builder, who can use the commonest cast iron or brass batts in the market. All kinds of cast-locks are sold, but the architect who does not study his details is none the wiser. Door furniture is happily reviving. Akin to the butt hinge is the mortise lock—another device invented to save the face of the door, or not to deface the joiner's work. It is also open to objection, though now made in the most perfect way. Largely hidden from view, very inefficient makes are substituted for the best made mortise locks, such as those of James Hill and Co. Why does the architect pay so little attention to the specification of these important fittings? Is it because he thinks there is little to choose between, and that any good ironmonger will supply these things? We know there are many exceptions—that there are men in the profession who will take the greatest trouble in ascertaining the points and merits of such things as locks, door-furniture, stoves, and sanitary fixtures: who will carefully look over the illustrated pages of the catalogues of well-known firms like Young and Marton's complete illustrated catalogue of all articles in building construction, or the valuable ironmongery catalogue issued by Nicholls and Clarke, so that no spurious should escape their notice; who will spare no pains in visiting the shops and warehouses where particular fittings are made, and in giving detailed drawings and instructions for any work of an artistic kind; but these exceptions only prove the rule. Take the case of locks. Many artistic members of the profession regard the "rim" lock to the mortise. It is a more honest way of making a lock; it preserves intact the strength of the middle rail, and expresses itself outwardly. Many of the leading firms have introduced admirable locks of this kind of construction; but the usual specification description, "Provide and fix to doors 6in. or 9in. wrought case rim locks with two bolts" suffices. Whether it is a 6in. iron rim lock of about 25. 6d., or one of superior quality of 35. 8s., it matters little to the architect as he writes his specification, and of course an indifferent class of make is selected. A like indifference is shown about bolts and latches, and if not specified to be wrought, or of the best quality, a very inferior article is used by the builder. We have said door furniture is improving. Our houses have been long subject to the cheap ironmongery taste such as china or brass knobs, escutcheons, and finger-plates. Lately there has been a higher standard of art applied, and the wrought-iron bolts and latches, and the finger-plates used in the best edifices, examples of which we have lately seen in building exhibitions, show a remarkable development of the manufacture that architects should encourage. Some of these metal finger-plates and handles are artistic productions. Flat and beaten iron and brass plates improve the appearance of the door. The use of complex appliances, such as those employed to open windows or to close spring-doors is objectionable. The architect who knows what he is about, and wishes to be true and honest, avoid any clumsy and complex arrangement, and selects the most direct and simple plan from firms like those of Leggott. Of all modern fixtures probably the chimney-piece and grate are the best satisfactory as found in ordinary buildings. They are often tawdry and cheap imitations of better designs, and on this account the architect ought to be on his guard not to allow poor substitutes. Between the designs for chimneys of wood or tile we see in the *Architectural Catalogue* or the Exhibi-

tion of the Board of Technical Education and those of the ordinary manufacturer a great gulf is fixed. The first is often just as eccentric and repulsive in its plainness as the other is tawdry and vulgar, and the artistic production is proportionately costly and out of the reach of the ordinary building owner, so that there is no alternative left but to select from an ironmonger's or building catalogue a chimney-piece and grate of commonplace design, with its imitation pillars, jambs, and carved mantel and Brummagem grate. If the architect insisted on designing his own chimney-piece and selected his own grate, he might see an improvement before long, and the stereotyped stock and cast patterns would be consigned to oblivion or the jerry builder. Provisional sums for these items should be stated in the contract, to be expended by the architect as he desired or directed.

Gas and electric-light fittings now enter largely into modern buildings; but these are generally left to the gas engineer or electric-light manufacturer. Many high-class firms consult the architect as to the wiring and the system, the selection of electroliers and other fittings, or they are left to the architect and consumer's approval in the specification. A great deal must be left to the firm, as for instance the proper per cent. conductivity copper for the cables and wires, the insulation size of cables and wires, the joints, casings, the kind of distribution boards, and their fixing in proper dry parts, the kind of fuses and switches, as well as the wiring arrangements. But the professional man ought to make himself proficient in the system and details of the work, so that he may exercise a control over the designs. Other fittings like the screens and woodwork and apparatus required in special businesses, public-house, or buffets, restaurants, and drapers' premises, are multiplied to an extent that renders any exact knowledge on the part of the architect impossible, and it is to this cause we must attribute so much of the obtrusive and tawdry sort of work and decoration. Some of these are atrociously vulgar and commonplace. But they constitute new fields for the specialist architect's work—for example, the decorative woodwork for walls. One kind is produced by a German process, and consists of wool pulp laid on a thin veneer and stamped by hydraulic pressure to a design by a steel mould. The result is fairly well executed, and some of the moldings, such as the egg and tongue enrichment, folial decoration, and figure subjects are produced.

In the development of plan the floor and wall fittings and fixtures form an important factor. The position of door and window openings, fireplaces, stoves, the position of seats and tables, desks, book-cases, beds, and other articles of furniture, must be determined before it is possible to draw a practicable plan. If we trust to accident, or imagine that all these things ought to fall into their places naturally, we commit a grievous fault, and a wrong on the owner, or those who occupy or use the room. In planning, say, a modern school or classroom, the actual area each pupil occupies should be determined, so that the superficial area of the floor can be fixed. It is extraordinary that with all our textbooks, we have none that will furnish the architect with data derived from experience as to floor areas for different purposes—they are only to be found in scattered works on the subject of school or hospital construction. A method that is practical and we have used, is to set out to scale one unit, say a seat and desk for a school, allowing the exact dimensions we wish to be employed in depth, that is from outer edge of desk to outer edge of seat and its width, and cut these units out in cardboard, so that they may be arranged as the real seats on the plan, say to 1in. scale. By so arranging and disposing of these units as they ought to come, the architect will be

able to set out the positions of windows and doors and other objects. Or a more expeditious plan is to cut out the whole areas occupied by desks and seats, with their gangways and passages, and then draw the plan accordingly. The newspaper stands, seats, and tables, and book-cases of free libraries can be set out also by this means, which is much more easy than drawing them to scale on the plan, and the separate unit method enables the designer to alter or adjust his seats to a better advantage. The plan will also be well adapted for setting out the beds and separate passage for each patient in a hospital ward, by means of small pieces of cardboard cut to the floor area or unit. Besides the advantage of adjusting the separate units to the plan, expedition is guaranteed, and the extra labour of indiarubber erasure and repencilling which is necessary in drawing on the plan is saved. Other purposes for which this method of tracing can be used, in the planning of council chambers, the grouping of the fittings for courts of law; also for the seating accommodation of churches, chapels, and concert-rooms, theatres, technical schools, and their classrooms. We believe that much floor area is often wasted in planning buildings of these descriptions by first drawing the plan and afterwards altering and enlarging it to make the seats and fittings fall in. Worse than all is to make a set of plans, and, after they have been carried out, discover that the seats or desks or the passage-rooms are too cramped to give the required accommodation. And these are the faults of the system which fixes the dimension of the building and its design before the fittings and fixtures are considered, on the principle that the latter must conform to the architect's building, not contrariwise. If plan and design are to be the outcome of utility, we must agree to the principle that every structure designed for accommodation, for instruction, for the treatment of the sick or infirm, and other similar purposes, should be governed by the unit, and that unit must be studied in the floor area, in the distribution of walls and windows and doors, and must express itself by these means in the building. The opposite course is a contradiction to every organic law.

DIVIDED BUILDINGS.

BUILDING appeal cases very often bewilder the man of common sense, and not infrequently confuse the meaning of the London Building Act in respect of important clauses of that statute. One of the most valuable of the sections of the Act of 1894 is that relating to fire-resisting divisions in certain buildings, in which, section 74 (2) it is provided that in every building exceeding ten squares in area, used in part for trade or manufacture and in part as a dwelling-house, the part used for trade or used as a dwelling-house shall be separated from the other by walls and floors constructed of fire-resisting materials, and all passages, staircases, and other means of approach to the part used as a dwelling-house shall be constructed throughout of such materials. This section has given rise to much litigation. It will be noticed that it seriously interferes with all buildings that are used partly for trade or commercial purposes and partly for occupation; with many large blocks of residences having the ground floor let as shops with public-houses, and with many other buildings of dual occupation. To evade the enactment all kinds of quibbles have been raised, and the district surveyor has to be on the alert to discover any infringement of the section in buildings re-erected. Many serious mishaps to life and property have resulted from the neglect of dividing buildings of this double character by fire-resisting floors and staircases, and several business premises have been destroyed and lives lost. The revision of the Act came, therefore, none

too soon. A recent appeal case to which we referred the other day illustrates the kind of opposition made to this section. A builder is desirous of re-erecting an old house—the lower floor to be let as shops, the upper stories as private rooms. The area exceeds the statutory 10 squares, but the floors are not proposed to be of fire-resisting materials. He is not at all aware that the Act applies to such a re-erection, and believes that the section can only be intended to prevent trades and manufacturers of an objectionable kind being carried on below rooms specially intended for dwellings. When the proposed building is intended for a public-house, the basement to be used for beer and wine-cellars, the ground floor for a bar, saloon bar, public lobby, parlour, and public room, and on the first floor a sitting-room, three bedrooms and a kitchen, and attics above, to be occupied by the licensee and his family, and the whole building covered by the justice's certificates and Excise license, the necessity for fire-resisting floors and stairs as required by the section may appear quite unnecessary. Such a case came up in the Court of Appeal before the Master of the Rolls, Lord Justice Vaughan Williams, and Lord Justice Stirling, when judgment was given in an appeal from the decision of a Divisional Court, on a special case stated by a Metropolitan magistrate. The notice of objection was served by the appellant, a district surveyor, under the London Building Act (1894), section 74, sub-section 2. The case has special interest, as the circumstances apply to many other buildings which are let partly for trade and partly for occupation. We now give a brief statement of the facts as first reported, and the decision of the Court upon the case.

The proposed building was situated in the Kent-road, and was the re-erection of a licensed beerhouse on the site of an old house of the same kind. When built it would exceed 10 squares in area, and was intended to consist of a basement, two floors, and an attic. The trade was to be carried on in the basement and ground floor, and the licensee and his family were to reside on the upper floors. The floor separating the ground floor from the first floor and the staircase leading to the first floor were not intended to be constructed of fire-resisting materials. The learned magistrate found that if the sub-section 2 of section 74 of the London Building Act applied to the building, the provisions of that section would be contravened. He also found that the basement and ground floor were intended to be used for the purpose of the trade of a beerhouse, and that the part above was intended to be used as a dwelling-house for the licensed occupier, but held that the case was governed by the decision in "Carritt v. Godson," in which it was decided that a fully-licensed publichouse did not come within this section, and allowed the appeal, and overruled the district surveyor's objection. The latter appealed, and the Court dismissed the appeal. The Lord Chief Justice said he did not base his decision on the above case, because in it there was one additional ground for deciding that the house was not within the Act, section 74 (2)—namely, that the lobby which gave access to the staircase of the house opened into a backyard. In his opinion, the section was intended to apply to buildings part of which were used for trade and manufacture, and the other part as a dwelling, and was not intended to apply to a building, certain rooms of which were used as a dwelling. The appeal was therefore dismissed. The district surveyor appealed to the Court of Appeal, and the Court allowed the appeal, the Master of the Rolls saying that he did not agree with the findings of fact found by the magistrate, but he was bound by them. He thought the magistrate to be inconsistent in finding as he had done, and also holding that the case was governed by "Carritt v. Godson"; but, accepting the

findings, it followed of necessity that the appeal must be allowed. Lord Justice Vaughan Williams concurred, also Lord Justice Stirling.

The Lord Chief Justice's decision may certainly appear, from the words of the report we here quote, to be almost a distinction without a difference. He said, in his opinion, "the section was intended to apply to buildings part of which were used for trade and manufacture, and the other part as a dwelling, and it was not intended to apply to a building certain rooms of which were used as a dwelling." The ordinary builder may well be excused for not understanding the distinction. Section 74 undoubtedly was framed to apply to every building exceeding a certain area used in part for trade and in part as a dwelling, irrespective of the number of rooms used for the latter purpose, as the intention is clearly to provide a means of resisting fire between the two, and to prevent loss of life; and this can only be done by separating the two parts by walls and floors and passages, constructed of fire-resisting materials. The safety of the dwelling-house is particularly intended by the mention that all means of approach to the dwelling-house portion shall be safeguarded in the way proposed. How any other argument can prevail or any extension of the principle of "Carritt v. Godson" be made to apply to exempt the conditions of this particular building we are at a loss to understand. The reversal of the former decision has put the matter on a clearer basis, and it ought not to be possible for any similar objection to the section to be entertained. A large number of the disastrous fires, many of them attended with loss of lives, have been the result of placing dwelling-rooms and bedrooms for families and employes above the ground and other floors used for business. We all remember the great Edgware-road fire, which occurred in a large drapery establishment, during which several young people in the upper floors were cut off from escape. The only protection for such a state of dwelling is to have floors and walls that will be invaluable to outbursts of flame, and means of escape like passages and staircases inclosed by solid brick walls. To draw any subtle distinctions between buildings so divided would be to render the section of no practical value. The point should rather be to insist that dwelling-houses, sitting-rooms, and bedrooms, wherever found in one block, with shops below, and of large area, should be protected in the manner intended by the section. It may be argued that certain trades and manufactures are less dangerous than others, and ought to be exempted from the operations of the Act; or that dwelling-rooms used by those who carry on the business below are not on the same basis as dwellings let to separate families. But these objections are not to the point, which is simply the protection of human life in any circumstances. The Act limits the operation to buildings exceeding ten squares in area, or practically to 1,000ft. super.; or, say, for example, a building 20ft. frontage and 50ft. deep. So that the section practically does not touch ordinary buildings of the size one generally sees in our streets, which may be built for dual use in the unprotected way, but only the few exceptional buildings of wide frontage or great depth. The time will come, no doubt, when the law will enforce a similar restriction to all buildings similarly divided or let; for at present the upper rooms of shops are often let to private families, or occupied as dwelling-houses, without any further means of approach or exit than the private staircase inclosed by walls or partitions of a very inadequate kind. Very often a large shop filled with inflammable materials, cotton goods, &c., has to be passed through to get to an old narrow staircase in the building, or side of the shop, after many windings and landings between wooden partitions or

matchboarded sides, lands one on the first floor, and probably from this floor to the upper stories another staircase ascends in another part still more objectionable. This is by no means an exaggerated description of half the old houses in our leading thoroughfares. Should a fire occur in the lower part of the building, the flames would spread with great rapidity. Structures of this combustible kind are gradually disappearing, and their re-erection affords a good excuse for the operation of the Building Act, and for the interference of the district surveyor. But still they largely abound in the older streets, and require careful supervision. For larger structures or portions used for trade which extend to more than 250,000ft., the rules relating to the buildings of the warehouse class come into force, and belong, therefore, to a different category.

HOW A CHURCH WAS BUILT BY AN HONORARY ARCHITECT.

THE experiences of the writer in his double capacity of honorary secretary to the building committee, and of honorary architect, may be of interest to some of those who are "about to build." The experience is somewhat unique, in that it is not often that an architect acts in the treble capacity of virtual organiser of the owners' committee, of the architect who makes the drawings, and of clerk of the works, at one and the same time. The case reminds one of the comic opera "Mikado."

In the first place, it should be noted that the writer was qualified as an architect, and could lay claim to a fairly practical knowledge of building operations. At the time of the building of this church he was obtaining an income in another line quite apart from architecture, and so was able to give honorary work in the erection of the building. The first lesson is one connected with preliminary sketches and approximate estimates. The writer happened to attend a general meeting called to consider the question of building the church, and, somewhat to his surprise, selected a man, quite new to the building committee, and, still more to his surprise, was appointed honorary secretary of that committee. He pleaded the lack of all knowledge of committee work, even of taking minutes, but was overruled. When the first meeting of the committee was held, it was decided to apply to an architect for a sketch and estimate, the site being already in the hands of the committee, and "in a week moment the writer, recalling his past connection with architecture, offered to make a rough sketch and estimate—of course, free of charge. This little matter of *con amore* work cost the writer before he was out of the wood all his spare and leisure time for some three years, to say nothing of personal worry and inconvenience. The moral is: Lesson No. 1.—That all depends on the preliminary sketch and the first rough estimate, the rest is all plain sailing. If the rough sketch is approved, the owners or committee then shut their eyes and simply say "Go on, and it is agreed that the building is to be erected," and so the architect hauled again from his clients, at least in the sense of being "hauled over the coals." Once at the inception of the idea, and once again when the final accounts are being cleared, and at these times only, do owners trust their architect to a little serious talk, and even then, it is generally only at the finish that it is at the beginning of affairs.

It has been stated that the site was already acquired, so there was nothing to be done but to fit the building to the ground, and it was now found that by some mischance the idea had never suggested itself to the committee who purchased the site, to try and ascertain how much space would be required, or what plan of building could be placed upon it. Here comes Lesson No. 2.—When you are buying land for a building of a certain class, always be sure that your building (of that class) can be put upon the ground, and that that can be done easily, with space all around it, and that it does not buy your cloth first, and then consider how you can get your man clothed out of it.

The site under consideration was very awkwardly shaped: it was practically square, and for a small church of 400 or 500 seats, such a shape is not the best. The final result was that the building had to be planned with wide nave and flat transepts, and even with this arrangement it

was found necessary to bring the building right up to the boundary on the principal road, and also up to the boundary at the back, and to keep it away ft. from the boundary at the other sides. The architect's first idea was to provide for 500 seats on the ground floor, and for this accommodation the area was amply sufficient; the building to be high enough internally for future galleries, and staircases for future stairs to be provided at the two front corners.

Now here occurred a grave mistake. The architect consulted the minister, who advised that for present economy the ground floor should only seat 400. The mistake was in not providing at once the space for 500 seats, and so using all the available area. It would only have entailed the building of the walls further apart, and making the roof of a little longer span, but as this was not done when the building is regularly filled, and the extension does come, as come it inevitably must, it will be necessary to add the side and end galleries, instead of only adding a few more seats in space already provided. The opportunity was lost, a good chance, and the necessary extra accommodation straight away was not accepted, and the building was unfortunately erected for the 400 seats. The architect sees his mistake now; but he has told nothing of this to his committee, and it is hardly probable that he ever will. *Lesson No. 3.*—*Don't forget your clients' wishes, always have one eye to the immediate future, especially when your ground is of sufficient area.*

Well, to continue the story, the thing went on; the architect drew plans, sections, and elevations to 1/16" scale, and had them exhibited three weeks. This was done with the hope that any fault would then be pointed out, and at a stage of the work when it was possible to rectify any mistake, and embody any improvement in the working drawings. Foolish, vain, and non-sensical idea! Not one single comment, not one improvement suggested, not one mistake pointed out! *Lesson No. 4.*—*Don't expect your clients to study very carefully your preliminary plans, they will merely study your work when completed, especially when the bills come in, and will point out to you each and every deficiency; but they will never take the trouble to do this before the last door-knob is put on the business is to erect the building that your client will require; but it is certainly not the business of your client to go out of his way to instruct you as to his requirements—at least, not until it is too late to be of any real use.*

Well, to go on. A general meeting was held, and a unanimous resolution was passed asking the author of the plans to act as honorary architect, and the plans were approved *in bloc*. Working drawings were made, approved by the local authority, and the contract was let. The contractor commenced the work, and documents and the commencement of the works until the nights were growing long, and the tempers of the committee very very short. The contractor was urged to commence, and then coolly said that he intended to commence in the ensuing spring. At the time the contract was made, the work broke off short; but, upon the persuasion of the architect, it was decided to allow the contractor to commence at the beginning of March on condition that the work was finished by the end of October, and upon the further condition that the terracotta was ordered at once, and the woodwork framed together. This was done, and very happily so, and here we learn *Lesson No. 5.*—*In a building with terracotta dressings, always order the terracotta six months before you want to start work.* In this case the contractor had not to wait a single day for terracotta, whilst on other contracts he kept owners and committees at boiling point for months until the terracotta makers could complete their orders.

We have said that the contract was made, and at the agreed time the contractor sent his men on to the ground to dig out the foundations. Now note what followed. Whilst on other contracts he kept owners and committees at boiling point for months until the terracotta makers could complete their orders.

the desired effect, and the howls ceased. Here comes *Lesson No. 6.*—*The first thing to do in building works is to erect your hoarding, and to let it be high enough.*

This point on, the building grew so that it could be seen above the hoarding, and once more the critics began to raise their voices. One candid friend went to the architect, and drew his attention again to the fact that the front of the building was not at the proper angle. "For the credit's sake," said this candid friend, "stop the work, and do as I suggest: go on the ground to-morrow morning, before breakfast, and tell the foreman to rebuild the wall on the right line before he goes up another foot." The architect here managed to get in something to the effect that it would be necessary to consult his committee and to make amended plans; but the candid friend replied, "Nothing of the sort: consult no one, make no plans, consider nothing—all that you need to do is to go to the builder's foreman and say, 'Rebuild the wall on the right angle,' and the thing will be done without the slightest trouble to anyone concerned." The architect now managed to say that this would make one staircase twice its required size, and another staircase one-half its necessary dimensions. The candid friend at this lost his self-control, and cried, "Here comes *Lesson No. 7.*—*Never let your professional affairs with candid friends, or, in fact, with anyone, if it can be avoided.*

Fortunately the builder had a very excellent foreman in charge of the work—a man who could foresee difficulties and arrange for the supply of materials before they were actually wanted, and all this in this respect worked well. The building grew without a hitch; and here comes *Lesson No. 8.*—*Always have a good foreman for the work, and see that your builder provides one.*

Months went on, the building was finished, and the architect was contented. It was "a work of art, and something done." Of course, various little items were amended or rearranged during the progress of the work. A superior quality of tiles was used in the entrance and vestibules, a different system of ventilation adopted, and troughs with gratings were provided, and hot water being piped instead of the pipes being placed above the floor. The mind of everyone was easy (including that of the builder) until the final accounts came in, and then it was found that the contractor had in all items altered from the contract schedule of prices, making very large charges, none of which, of course, good profit, even if his original contract had not been lucrative in any degree. Now the time had arrived to learn *Lesson No. 9.*—*When deviating from the contract schedule in any degree, always get a price from your builder for the amended work, and do not leave it for settlement at the close of the work.*

And so, at last the building was finished, the office services were held, and things were set in working order. Seats were allocated, and the trouble of the honorary architect, which he thought was great before, now became intensified most alarmingly. The architect thought that he had some few friends amongst the members of the committee, but he had more critics who much preferred the attitude of a critic to that of a friend. Every little defect, every little crack, every little shrinkage, every little draught, was most carefully and laboriously pointed out again and again to the architect, and although he did his best to ignore the criticisms, he knew that all that could be desired, yet he was sufficiently sensitive to the critical remarks to feel that they overbalanced the praise and approval that he also received. Now here lies *Lesson No. 10.*—*Don't live in the house of which you have been the architect, and don't attend to church of which you have been the architect's drawings.* Englishmen have several prerogatives that they hold very dearly, one of which is the right to grumble at other people's work, and if he forgets the last lesson the architect cannot exercise this right, and accordingly is more or less miserable.

In conclusion, the writer, who was the architect, desires to comfort himself with the thought that his committee were a very good sort, and caused him no trouble; had they not been so kind, his troubles would have been much greater. Things have so settled down, and the architect is so comfortable, that it will be a considerable time before the writer consents to act again as an honorary architect.

The Bishop of Beverley has reopened the parish church of Wistow, Yorks, after restoration, at a cost of £2000.

BUILDING REGULATIONS FOR HIGHER ELEMENTARY SCHOOLS.

THE Board of Education have issued the following rules as to buildings of higher elementary schools.—(1) A class in the Code limits the numbers of a higher elementary school to about 300. For such a school ten classrooms will generally be required, since every class should have its own classroom. Of the ten classrooms, at least four should be suitable for a class of 40 scholars.—(2) A classroom of 40 scholars should have an area of about 620sq. ft.; a classroom for 30 scholars should have an area of about 480sq. ft.—(3) All classrooms must be furnished with single desks; the desks should be 2ft. long, arranged in pairs of timbers of 2in. and gangways of 2ft. (3) A higher elementary school should be provided with suitable laboratories.—(4) The laboratory accommodation must be sufficient to provide at one time for the largest class in the school.—(5) There should generally be one laboratory for chemistry and one for physics.—(6) A laboratory should afford 600sq. ft. of floor space, and a minimum size will therefore be 600sq. ft., but it is, as a rule, desirable that the laboratory should be somewhat larger. If, however, the laboratory accommodates more than 25 scholars a second teacher would be required.—(7) Laboratories must be fitted with suitable tables which must be well lighted; they should be properly supplied with gas and water. For chemical laboratories, sinks, cupboards, and the necessary fume-closets must be provided.—(8) A small balance room may be provided if desired.—(9) In addition to the classrooms and laboratories, it is desirable that a higher elementary school should include at least one lecture-room, which should be fitted with (1) demonstration table furnished with a gas and water supply and a sink, and (2) a fume-closet. A lecture-room should have an area of about 750sq. ft.—(10) A suit preparation room fitted with bench sink, cupboard, and shelves, and proper supply of gas, should be provided in a convenient position for the lecture-room.—(11) A drawing classroom for the more advanced drawing is desirable. It should provide 300sq. ft. of floor space for each scholar; the best single table will be 7ft. 6in. by 3ft. 6in., and 750sq. ft. If suitably lighted the hall would answer for this purpose.—(12) Other special rooms for coking, laundrywork, and manual instruction should be provided in accordance with the rules in Schedule VII. of the Code.—(13) A higher elementary school must be provided with a central hall, (other than drawing) can be recognised in such a hall. Good dimensions for such a hall would be 50ft. by 25ft. As an alternative the hall might be adapted for use as a gymnasium when occasion requires. Such a gymnasium for a school of 300 children should have a floor area of 1,000sq. ft. The gymnasium should not be adjacent to the laboratories.

BRITISH AND IRISH BUILDING STONES.—XXVIII.

MERIONETHSHIRE.

THE rocks in this county are Wenlock Shale, Lower Llandovery Beds, Hiranant Limestone, Bala Beds, Llandellio Flags, Arenig Beds, Tremadoc Slates, Lingula Flag series, Menapien Beds, Harlech and Bala. Bala is a local name for the Harlech and Lava series which overlie the Tremadoc Slate. Aberllyn is built on Bala Beds. Bala: Alluvium and Lower Silurian blackshales. Dolgelly: Tremadoc Slate, Alluvium, Greenstone. Harlech: coarse Cambrian Sandstone, Alluvium. Bala: coarse Cambrian Sandstone, Alluvium. Glendal Drift in this county, and Arenig Mountain furnished much of that now found in the Vale of Clwyd. The rocks in many places are scratched, grooved, or polished by the action of large masses of moving ice, which would be indicated from this district. The occurrence of broken sea shells in the sand and gravel found on some of the hills at heights of over 1,350ft. above the sea level proves that these high lands were all submerged at some comparatively recent period. Alluvium is found along the river valleys; it consists of sand and gravel, and in many places the deposits cover considerable areas, as, for instance, along the Dec between Bala and Cernwen, the lower reaches of the Afon Llŷw, where it enters Bala Lake; the valley of the Pryser, near Trwsfnydd; the Tract Mawr, west of Llanfihangel, and the Afon Dysynni, about Towy. Alluvium is

is found along the coast from Treach Bach to Barmouth, and again south from Towy to Aberdovey. The solid geology of the county is represented by Silurian and Cambrian rocks, with intrusive igneous rocks; like Carnarvonshire, it is a slate-producing county, the workings being chiefly small mines, but there are a comparatively small number of large slate quarries. The Lower Llandovey rocks both belong to the Lower Silurian system, the rocks of which are shown in recent maps as not yet definitely separated by the officers of the Geological Survey. Wenlock shale is found along the county boundary on the north-east, from near Llangollen on the east, to Bwch on the west, and in the north-west to near Corwen. West of this latter town the Wenlock beds turn south by Llandelfryn, and cross the county boundary into Montgomeryshire around Moel Gediog. The so-called shale consists of shales with slates, flags, and sandstones. The chief quarry in it is that known as Dee Side, near Llangollen, where the Wenlock shales are quarried; here, the chief mines being at Moelfera, near Llangollen (178 men), the Moelfera and Dee Side Slate and Slab Co., Ltd., and Corwen (50 men), the Corwen Slate Co., Ltd. The quarry and mines yield blue slates of the usual size. The Lower Llandovey Beds are found south-east of the Wenlock shales, and consist of a series of well separated ranges along the south-east of the county to the coast between Towy and Aberdovey on the west, in Cardigan Bay. All the rocks in this district are sandstones and conglomerates with beds of shale and slate. The chief mines in them are Bryn Eglwys and Gantnydd (212 men), where they are employed in the native, and 113 men above ground, at Abegwyl, near Towy. The Bryn Eglwys and Gantnydd Slate Quarries Co., Ltd., Hendreddu, Aberangell (39 men), Mr. J. Bradwell; Gartheiniog, Aberangell (25 men), Mr. H. Mallory; and Minllyn, formerly Carylco, Dinas Mawddwy (32 men), the Minllyn Slate Co. The chief slate open work is at Maes-y-Gamfa, Aberangell (22 men), Mr. Walton and Mr. E. H. Davies. The lower beds of the Lower Llandovey series, the most recent of which is the blackish impure psillitic limestone found between Bala and Dinas Mawddwy, known as Hirnant Limestone. This limestone is, however, by no means constant, for north of Aberhirnant it is represented by grits and shales, and in other districts by grits and sandstone. The limestone of the Hirnant Limestone furnishes a building stone of any importance. The only limestone quarry scheduled in this county is that at Hafod near Corwen, which is probably a Silurian limestone; this is worked for lime-burning. Bala Beds are sandstones, slates, and limestones, and the rocks which are mainly interbedded with the Cambrian rocks. The latter are worked in a few temporary, and they consist of andesite, felsite, basalt, diabase, dolerite, &c., all of which were formed during the deposition of the Bala rocks. The various divisions of the Cambrian rocks from the Bala Beds to the lowest, or Harlech series, are of interest to the geologist only. The principal mines in the Cambrian rocks in the Festiniog and Corris districts are divisions are worked near Barmouth and Portmadoc. The principal mines in the Cambrian rocks are: Oakeley (1,590 men), The Oakeley Slate Quarries Co.; Llechwedd (630 men), Messrs. J. W. Greaves and Sons; Votty and Bowydd (40 men), Messrs. Votty and Bowydd; Votty and Bowydd Slate Quarries Co., Ltd.; Maenoffery (120 men), Messrs. J. W. Greaves and Sons; Votty and Bowydd Slate Quarries Co., Ltd.; Rhosydd (18 men), The New Rosydd Slate Quarry Co., Ltd.; Diphwys Casson (71 men), The Diphwys Casson Slate Quarries Co., Ltd.; Wrysgan (110 men), The Wrysgan Slate Quarry Co., Ltd.; Cwmorthryn (12 men), The New Welsh Slate Co., Ltd.; Bwledd (12 men), The New Welsh Slate Co., Ltd.; Cwys-y-ddwy-afon (3 men), The Cwys-y-ddwy-afon Slate Quarry Co., Ltd.; There is an open work at Craig Ddu (212 men), Mr. R. Bowton. All the above are in the Balaenau Festiniog district. In the Corris district the principal mines in Cambrian rocks are Braichgoch and Llanfyllin. The Braichgoch and Llanfyllin Slate Quarries Co., Ltd., Aberllefenni (147 men), Mr. A. R. Pryce; Abercorris (39 men), The Abercorris Slate Co., Ltd.; and the principal open work Abercwmiddau (61 men), The Abercwmiddau Slate Quarry Co., Ltd. There are also mines near Portmadoc at Croesor (122 men) and Porthmadoc (122 men), The Porthmadoc and Croesor Slate Quarries Co., Ltd. There is another important slate mine at Hendell, near Barmouth, worked by The Cambrian Estate Consolidated, Ltd. The igneous rocks are worked

for road-metal at Minffordd, The Pwllheli Granite Co.; Tonfanau, Towy, Mr. J. Corbett; and Craigwen, Dolgelly, Mr. J. R. James. Though Silurian grits are worked at Wern Ddu, near Corwen, at Plas Isaf, near Festiniog, and other places, some of which furnish good building stones: they are used for building locally only.

The following list gives particulars of the blue slates from the Blaenau-Ffestiniog district, and which are now shipped at Portmadoc.

Names.	1st Quality, 15 Medium, 12 Low.	2nd Quality, 12 Medium, 9 Low.	3rd Quality, 9 Medium, 6 Low.	4th Quality, 6 Medium, 3 Low.	5th Quality, 3 Medium, 1 Low.	Sizes	The Ship 1200 will Cover.
	g s. d.	g s. d.	g s. d.	t. c. q.	in.		
Emperors	17 10 0	13 5 0	9 0 0	4 0 0	2 6 0	in	15,33
Small Emperors	16 15 0	11 0 0	0 0 0	3 15 0	0 26 x 14		12,25
Princesses	14 15 0	12 5 0	9 0 0	3 15 0	0 26 x 11		14,37
Princesses	13 15 0	12 5 0	9 0 0	3 15 0	0 26 x 11		14,37
Small Duchesses	11 15 0	9 15 0	0 0 0	2 10 0	0 22 x 11		9,30
Small Duchesses	10 15 0	9 15 0	0 0 0	2 10 0	0 22 x 11		9,30
Marchionesses	11 15 0	9 15 0	0 0 0	2 10 0	0 22 x 11		9,30
Marchionesses	9 0 0	5 10 0	0 0 0	1 10 0	0 18 x 10		6,25
Wide Viscountesses	7 10 0	0 6 15 0	0 1 12 0	2 15 0	0 28 x 10		7,63
Small Viscountesses	6 10 0	0 6 15 0	0 1 12 0	2 15 0	0 28 x 10		7,63
Wide Ladies	6 7 6	5 12 6	0 7 2 16 0	1 7 2 16 0	10 x 9		4,81
Broad Ladies	5 7 6	5 0 0	0 1 5 0 0	1 5 0 0	9 x 9		4,48
Duchesses	5 3 0	4 17 5	0 1 1 17 5	0 1 1 17 5	8 x 8		4,38
Ladies	5 13 0	4 17 5	0 1 1 17 5	0 1 1 17 5	8 x 8		4,38
Square Headers	7 0 0	6 0 0	10 15 0	14 0 0	14 x 14		6,42
Wide Headers	6 5 0	5 0 0	10 10 0	14 0 0	12 5 0		5,50
Narrow Ladies	5 2 0	4 5 0	0 1 1 17 5	0 1 1 17 5	8 x 8		4,38
Small Headers	4 6 3	3 15 0	0 2 2 13 0	0 2 2 13 0	10 x 8		4,16
Small Ladies	3 17 6	3 2 6	0 1 0 11 8	0 1 0 11 8	8 x 8		3,66
Narrow Ladies	3 17 6	3 2 6	0 1 0 11 8	0 1 0 11 8	8 x 8		3,66
Long Doubles	3 17 6	2 6 7	0 6 15 0 13 0	0 6 15 0 13 0	7 x 7		2,92
Doubles	3 15 0	3 5 5	0 1 0 12 0	0 1 0 12 0	10 x 8		3,75
Wide Doubles	3 15 0	3 5 5	0 1 0 12 0	0 1 0 12 0	10 x 8		3,75
Small Doubles	3 15 0	3 10 0	0 1 0 12 0	0 1 0 12 0	10 x 8		3,75
Square Singles	2 15 0	2 10 0	0 17 12 0	0 17 12 0	10 x 8		2,80
Singles	1 17 6	1 6 1	0 16 12 0	0 16 12 0	10 x 8		1,93
Fractions	1 2 6	0 17 6	0 12 2 11 5	0 12 2 11 5	5 x 5		1,60
Units	1 2 6	0 17 6	0 12 2 11 5	0 12 2 11 5	5 x 5		1,60
Wide Doubles	1 17 6	1 6 1	0 16 12 0	0 16 12 0	10 x 8		1,93
Odds	0 17 6	0 15 0	0 10 10 5	0 10 10 5	5 x 5		1,45

The second and third qualities Festiniog slates are made in the following sizes—viz. :—

Second Quality.				Third Quality (Damp-courses).			
SIZES.		Computed Weight per 1,200.	SIZES.	Price per 1,200.	Computed Weight per 1,200.		
in.	in.	t. c.	in.	t. c.	in.	t. c.	q.
24	x 8	29 10 0	4	0 0	20	9	2 15 0
24	x 12	8 15 0	4	0 0	18	9	2 0 0
22	x 12	7 12 0	6	0 0	16	9	1 17 2
22	x 11	7 2 0	8	0 0	14	9	1 14 0
20	x 10	6 12 0	8	0 0	12	9	1 5 0
18	x 10	4 17 6	6	2 2	11	9	1 2 2
18	x 8	4 2 6	6	2 2	8	9	0 17 2
16	x 8	4 2 6	6	2 2	7	8	0 12 0
16	x 9	3 12 6	6	1 2	2	—	—
16	x 8 3/4	3 12 6	6	1 2	2	—	—
16	x 8	3 3 6	6	1 0	0	—	—
14	x 12	4 0 0	6	1 0	0	—	—
14	x 10	3 7 6	6	1 17 2	0	—	—
13	x 10	2 17 6	6	1 7 2	0	—	—
12	x 8	5 3 6	6	1 3 6	0	—	—
14	x 7	2 0 0	6	1 3 2	0	—	—
13	x 7	1 15 0	6	1 0 0	0	—	—
12	x 8	1 15 0	6	1 0 0	0	—	—

All slates are sold by the thousand of 1,200. 1s. 6d. per M is charged for loading on rail (which is done at purchaser's risk); 60 slates are allowed for breakage in every thousand. Terms are cash monthly, less 2½ per cent.

Queen sites are sold by the ton of 20cwt. They are from 24in. to 34in. long, and of various breadths. "First quality" cost 110s. ton and upwards; "medium quality" 100s. and upwards. Slate slabs are worked with two planed faces from 4in. to 2in. thick and upwards.

MONTGOMERYSHIRE.

The rocks here are Carboniferous Limestone, Ludlow Beds, Wenlock Shale, Denbigh Grits, Tarannon Shale, Llandovery Beds, and Greenstone.

Llanfair is built on Wenlock shale. Llanidloes: Lower Llandovery Rocks. Monguowry: Wenlock Shale and Greenstone. Newtown: Wenlock Shale, Ludlow Rocks. Welshpool: Alluvium, Wenlock Shale, and Caradoc Beds. A very small exposure of Carboniferous Limestone is found in the extreme east of the county, where it enters from Shropshire. This is the termination southwards of the Carboniferous Rocks of the Oswestry Coalfield. The stone is quarried for lineburning at Llannaynch, by Mr. F. Chubb, the total number of men employed being about 42. The labour in Carboniferous Limestone is so great when worked into dressings that it is

limestone used for that purpose. It makes good stone and rough walling stone, and, though sometimes used for road-metal, it is inferior to basalt or other igneous rocks where there is heavy traffic. Ludlow Rocks are found south of Newtown : the lower series, which consist of grey sandstones and sandstone forming Kerry Hill to the west and a large quarry at the foot of Long Mountain. These rocks furnish rough walling stones only. With the exception of a few areas occupied by intrusive igneous rocks, the whole county may be said to be covered by Wenlock Shale. Sometimes the rocks of this formation are seen as true shales. Near Llan-danol and at Llanygwyn, the shales, flagstones, and in other localities the lowest beds are shales and grits of great thickness, forming such an important departure from the normal shale beds to warrant geologists in classifying them separately as "Denbighshire Grits and Flagstones." They form the base of the Wenlock rocks and are covered by the flagstones of the Wenlock shale. In the Long Mountain, to the north-east of Forden, the Shropshire calcareous Wenlock strata may be seen in transition to the sandy rocks of Denbighshire; but near Montgomery and Welshpool the arenaceous type of rock is unknown. Taranon Shales underlie the shales and are covered by the flagstones of the Wenlock formation. They are so-called from the development along the river Taranon in this county. They consist of purple, blue, and grey slates and shales. Any fossils they contain belong to the Wenlock rocks. Lower Ludlow grits, conglomerates, and sandstones are covered by the flagstones of the Llangynwyl, Meifod, and other places. Bala shale of the Upper Cambrian rocks is worked at Buttington, near Welshpool, for brickmaking. There is an important slate quarry in the Wenlock shale at Llwyngwern, worked by the Nagloga Quarries, Ltd. It is about three miles from Machynlleth, and gives employment to about 200 men. The slate is quarried in the same district at Esgarigoll, by the Eira Welsh Slate Quarries, Ltd. (this mine was formerly known as Ffronfelen). There is another mine worked for slate at Rhiwarth, Llangynwyl, Mr. Owen Roberts. Wenlock grit and sandstone are quarried at Penstrowed, Newtown, the Montgomery County Quarries, Ltd. (this quarry is worked by the Llangynwyl, Meifod, and other places). In Llangraig-y-Maen, by the same body. These grits are used chiefly for road metal. Volcanic rocks, Andesite, Diabase, and Ash, are quarried at Standard, Welshpool, Mr. J. Baker; Castle, Montgomery, Mr. S. Davies; Den, Church Stoke, Mr. P. Taranon; Fardog, Llangynwyl, Mr. J. Roberts; and Hafod, Llanfryn, and Pen-y-croft, by the Montgomeryshire Central Coal. There are extensive alluvial deposits in the valleys of the Yrwyng, the Afon Dyfi, and the Severn, which yield sands and gravels derived from the denudation of the Wenlock rocks, through which these rivers flow. It will be seen from the foregoing that the Wenlock rocks are of great value, that they yield building stones of local importance only, and fit chiefly for rough walling. Baryte is mined at Weston Chirbury, the sulphate is frequently used in the "manufacture" of white lead. Lead, zinc, and copper ores are also worked in several mines near Llangynwyl and Llanfyllide. There are also several small, but some of the late mines and quarries mentioned above, yield the only building materials sent out of the county.

WOOD-WORKING MACHINERY.

MESSRS. A. RANSOME AND CO., LTD., Newark-on-Trent, and 304, King's-road, Chelsea, have brought out a new illustrated catalogue of their wood-working machinery. The increasing demand for machinery and labour-saving appliances have obliged this long-established and well-known company to move their works, and they have now moved their works at Chelsea and foundry at Battersea to Newark-on-Trent, where an extensive factory has been erected upon a freehold site of ten acres, adjoining the goods station of the Great Northern Railway, two sidings of which run into the works. The new factory will accommodate 1,000 workmen, and the shops are of a modern business requires. The up with the latest labour-saving machine-tools, and with every modern appliance for cheapening production. The catalogue we have before us gives several photo views of the works and

PARTIET FLOORS.

Lead complete (exclusive of base). Prices are for quantities not less than 500ft. super, and including wax-polishing, ordinary patterns.

	lin.	lin.	lin.
	solid.	solid.	solid.
oak filling	per ft. super.	1 2	1 6
ditto, border	per ft. super.	1 6	2 1
Borders of oak round hearths, 3in. to 4in. wide and 3in. to 4in. thick, wrought and nailed, including making floor for same	per ft. run	0 8	0 8
Dovels 3in. diam., including holes, 2in. long by 3in. diam.	each	0 0	0 0

SOUND BOARDING AND STRETCHING.

	lin.	lin.	lin.
3in. sound boarding, including 1 1/2in. by 1 1/2in. fillets	per square	17 2	17 2
ditto ditto, with edges shot	per yd.	19 0	19 0
3in. by 1 1/2in. herring-bone strutting	per yd.	1 0	1 0
1 1/2in. joists, and nailed	per ft. run	0 3	0 3
Plaster, 3in. thick, and 3in. boards supported by 2in. by 1 1/2in. fillets nailed to ends of joists	per square	25 0	25 0

BOLLS.

	lin.	lin.	lin.
2in. dead roll for lead, and fixed	per ft. run	0 2	0 2
ditto, hinged, and fixed	per ft. run	0 2	0 2
Mitre to ditto, one intersection	each	0 1	0 1
Ditto two hips with ridge	each	0 3	0 3
Splayed ends to rolls	each	0 1	0 1

PARTITIONS.

Description.	lin.	lin.	lin.
Dead, framed square and flat	s. d.	s. d.	s. d.
per ft. super.	1 2	0 7	0 9
Ditto, if left rough on one side	0 1	0 1	0 1
Add if mounded on one side	0 1	0 1	0 1
Add for every portion of a door	each	0 1	0 1
a sash	0 1	0 1	0 1

Framed work, circular on plan, flat sweep, 1 1/2 times above prices.

Framed work, circular on plan, quick sweep, 2 times above prices.

CASEMENTS, SASHES, AND SASH FRAMES.

With straight heads, circular sashes being measured as square.

	lin.	lin.	lin.
Bevelled or mounded bar sashes, fixed	per ft. super.	0 6	0 7
Add if hung with, and including, best fax line and round iron pulleys (pulley takes with frames)	per ft. super.	0 2	0 2
Add to sashes if hung with hinges or pivots, exclusive of value of the hinges or pivots	per ft. super.	0 1	0 1
Add for edges or mounded ends to sashes	each sash	0 4	0 4

	lin.	lin.	lin.
Dead-cased frames prepared for sashes, with oak sunk and weathered, grooved for iron tongue and for window-board if required, 1in. dead outside and inside linings, 2in. heads, 1 1/2in. pulleys, tongues to inside and outside linings, 3in. parting beads, 3in. back linings and parting slips, the inside beads 1 1/2in. wide and 3in. thick; double hung, and including and fixing beads, side pulleys; and plugging to wall, per ft. super.	0 10	1 0	1 0
Solid frames, common or transoms prepared for 1 1/2in. or 2in. sliding sashes or sashes hung on pivots	per ft. super.	0 10	1 0
1 1/2in. by 3in. rebates on the solid if required, with oak weathered and rebated slips grooved for tongue or window-board if required, 1in. dead outside and inside linings, 2in. heads, 1 1/2in. pulleys; and plugging to wall, per ft. super.	0 10	1 4	1 4
3in. heads and tongues, both included, bedded in white-lead	per ft. run	0 2	0 2

SHUTTERS.

Prepared to be hung with hinges, or lines and weights, or to slide, including labour of hanging, and exclusive of hinges and screws and fixing them.

Description.	lin.	lin.	lin.
Two panel, framed square and flat	per ft. super.	0 8	0 11
ditto ditto mounded on one side	0 10	1 1	1 1
ditto ditto ditto on two sides	0 11	1 3	1 3
ditto ditto, framed square and flat	0 10	1 1	1 1
ditto ditto mounded on one side	0 11	1 3	1 3
ditto ditto ditto on two sides	0 12	1 5	1 5
old if hung in two or more brackets with side	0 13	1 7	1 7
old if hung with and including best fax line and round cast-iron weights	0 2	0 2	0 2

JAMBS, SOFFITS, ETC.

Description.	lin.	lin.	lin.
Jambs and soffits of deal, plain, wrought, and fixed complete, including beading, scabing, etc.	per ft. super.	0 5	0 6
Ditto, single rebated, ditto	0 5	0 6	0 6
Ditto, double rebated, ditto	0 6	0 6	0 7
Ditto, framed square and flat, in one or two panels, ditto	0 8	0 9	0 10
Ditto, in three or four panels, and ditto	0 9	0 10	0 11
Add if rebated one edge	0 0	0 0	0 0
Ditto two edges	0 1	0 1	0 1
Add if mounded or bead and flush	0 1	0 1	0 1
Add if jambs or soffits are fixed on splay	0 0	0 0	0 0
Backs, soffits, or soffits, as for windows and back linings, and fixed complete, glued and keyed	0 10	1 0	1 0
Ditto, ditto, framed square	0 8	0 9	0 9
Ditto, ditto, head and flush	0 9	0 9	0 9
Add if mounded	0 0	0 1	0 1
Windows, boards, and doors, with rounded edge, and bearers	0 6	0 7	0 7
Ends of ditto fitted to jambs and returned	each	0 4	0 4

STAIRCASES.

	lin.	lin.	lin.
1 1/2in. treads with rounded nosings and small moulding beneath, and 1in. risers, including labour of fitting, blocking, and bracketed on, and including strong iron carriages	per ft. super.	1 0	1 0
Ditto, if left rough on one side, and if mounded	each end	0 6	0 6
Ditto, if mounded	each end	0 4	0 4
Brackets mitted to riser	per ft. run	0 2	0 2
Curral end to bottom step and fixed	per ft. run	0 2	0 2
Housing to tread and riser	per ft. run	0 2	0 2
Returned moulding nosings to ends of steps, including mitres	per ft. run	0 3	0 3
Ditto, if mounded	per ft. super.	0 6	0 6
Ditto, wrought two sides	0 8	0 8	0 8
Ditto, add if mounded	0 1	0 1	0 1
Ditto, add if cut for steps and risers	0 2	0 2	0 2
Ditto, add if mitted and cut ditto	0 5	0 5	0 5
Ditto, extra only for ramps	per ft. run	0 6	0 6

String-boards are generally assumed to be 12in. wide.

(To be continued.)

QUEENSLAND FOREST TREES.

As may be inferred, Queensland, lying within two zones (10° to 28° South), and with over 2,900 miles of coast, possesses a remarkably rich and varied flora. The dense scrubs frequently bordering the rivers contain trees which supply valuable timber, whose stems are often clothed with superb climber, and the undergrowth is intermixed with ferns exceedingly beautiful and of almost endless variety. The more open or forest country and the downs are covered with rich and nutritious grasses and other fodder plants. Few plants are to be met with of a poisonous or deleterious character, while many of great value for railway sleepers and all uses in which endurance is required, still only a very few of the timber trees are at present cut for use, and these are a mixed lot sold under the names of "hard" and "soft" woods. The hardwoods are principally supplied by the Eucalypts, and denominated Ironbark, Gum, Box, Popppermint, Stringybark, and Turpentine. The softwoods are almost entirely derived from the various Pines. Hardwoods are generally obtained in open or forest country, softwoods in the scrub lands often met with on the tops of the ranges; yet this rich scrub soil often produces some of the very best hardwoods, as, for instance, the Johnston River hardwood, which is considered second to no timber in Australia for strength and durability: also Thozet's Box, one of the most valuable Eucalypts found in the scrubs bordering the Fitzroy.

Amongst the hardwoods, where strength and durability are required, those known as Ironbark take first rank. Of these there are several kinds, the best being obtained from *Eucalyptus siderophloia*, of which there are two kinds of wood, one red and the other a brownish-grey, both excellent timbers, though the red is the favourite; *E. crebra* or the Narrow-leaved Ironbark, which has a

grayish wood, very strong and durable, and the Palmer River Ironbark, better known by the keon-like fragrance of its leaves, from which it received its local name, than as a timber. The wood of this last, though very hard and of a rich red colour, is usually small and pippy.

The trees known as Stringybarks supply excellent timber for sawing and splitting; the kinds cut under this name are usually *Eucalyptus amata* and *E. agyriensis*. Nearly resembling those in bark are the trees sometimes called Turpentine (*E. microcarpa*), a very hard, strong, durable timber; *E. Balyana* and *E. resacra*, two excellent timbers with a fibrous bark, from which circumstances they are at times known as Stringybarks.

The timber generally known as Gum is furnished by those Eucalypts which annually shed their barks, as the Blue Gum (*E. botryoides*), the Poplar Gum (*E. platyphylla*), the Grey Gum (*E. saligna*), the Spotted Gum (*E. wandularia*), the Woollybutt (*E. botryoides*), and the Moreton Bay Ash (*E. tessellata*). The bark of the last two is persistent at the base. There are also several others called Gum-trees, but those noticed first are the best timber. The so called Box is a name under which several trees supplying good useful timber are known, as Poplar Box (*E. populifolia*), Gum-logged Box (*E. hemphillia*), Thozet's Box (*E. Racetrack*), and also the Brisbane Box (*Cratogeomys capensis*).

Two trees are designated Bloodwood. The Common Bloodwood (*E. corymbosa*), is only adapted for using whole, as it often contains cavities in the wood so full of gum as to render it useless for sawing; it is, however, the favourite timber, on account of its durable nature, for house-stumps, piles for bridges, and other works where it can be used. The second Bloodwood (*E. trachyphloia*) is very similar, but the wood is of a lighter colour, and not quite so durable.

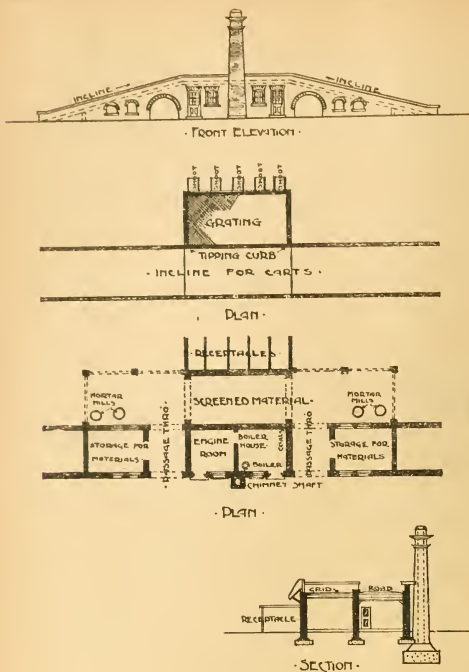
The hardwood of the Johnston River is furnished by a species of *Buchanania*, *B. Bancroftii*. This is a very tall erect tree, and, so far as is yet known, the bark is both durable and strong, does not crack or warp, and is easy to work. The Broad-leaved or Paper-barked Tea-tree (*Melaleuca leucodendron*), the Mahogany—Tom Russell's Mahogany, as it is sometimes called—*Lyrodia teretifolia*, and the Swamp Mahogonies (*Eucalyptus robusta* and *Bristonia macrodon*), are timbers of a high quality, though the last mentioned is useless except under water, when it is extremely durable.

The hardest wood, however, of Australia is that of *Erythrophloeum Labouchei*, a tree met with in North Queensland, from the Endeavour River to Normanston. The wood of this tree is a rich red in colour, and takes a high polish.

The soft woods in use are the Bunya (*Arctocarpus Bidwillii*); Moreton Bay or Hoop Pine (*Arctocarpus Cunninghamii*); Dandathu Pine (*Agathis-Dandathu, robusta*); the She-pine (*Podocarpus elata*); and several of the *Callitris* under the name of Cypress Pine.

For cabinet and ornamental purposes the following are in high request:—Red Cedar (*Triplaris Gordonii*), the Mountain Cedar, the English market: Yellow-wood (*Flindersia trilepis*), and others of this genus, especially *E. australis*; Silky Oak (*Grevillea robusta*); Deep Yellow-wood (*Rhus rhodantha*); Tulip-wood (*Harporhiza pendula*); and Beech (*Guelinia Leichardti*), a tree attaining a great size. The wood of the last is in the highest request for verandah flooring and deck plankings.

Other woods suitable for cabinetwork are *Eucalyptus Bancroftii*, a tree with a firm light spongy wood, and a quantity of very hard, prettily marked heartwood, though perhaps its true value will be in its proving a substitute for the American Lignum-vitæ in the manufacture of blocks, pulleys, &c., than as a cabinet wood; several of the *Eucalypts*, all having a white, pale, or yellowish Satinwood (*Zanthoxylum brachycephalum*), one of the most beautiful yellow woods known: *Freycinetia*, a common tree in most Queensland scrubs, having a large quantity of beautifully marked dark heart; *Siphonanthus australis*, another scrub tree whose wood is nearly white, with very resembling ivory when polished; *Alphitonia australis*, growing a heartwood somewhat resembling Walnut, but apt to warp in seasoning; the Queensland Ebony (*Bumelia* and *Bakeri*), a rich-coloured hardwood, very suitable for veneering; the Scrub Sandalwood (*Erythron latifolius*); the Australian Olive (*Ossea*); and many species of *Acacia* commonly called



Mydles or Wattles, and remarkable for their rose-like fragrance.

Handsome woods are produced by the "Dead-finish" (*Albizia leucodonta*), *J. concolor*, *J. hirsuta*, *Fraxinus*, several of the genera *Tremanthus*, *Maba*, *Grevillea*, *Hakea*, *Xylocarpus*, *Stenocarpus*, and *Banksia*, the timber of the last five being known as Redwood, the Silky Oak, the Gulf country gutta-percha, *Eucalyptus parvifolia* is very prettily marked and conspicuous for its beauty, and the Thready-barked Oak (*Caesalpinia*).

Tanning Barks. Many of the indigenous plants are known to be rich in tannin; but only a few of the barks are collected for use, and these are almost entirely confined to the various *Acacia*, one kind *Acacia decurrens*, being the most extensively used, though it is quite certain that several other species yield barks equally rich in this valuable property. Several of the *Eucalyptus* are used, but not to any extent. The barks of the Mangrove—which trees are so abundant along the coasts—have been used in India and elsewhere for tanning, though the trees in Queensland have never been barked for this purpose.

THE DISPOSAL OF HOUSE AND OTHER REFUSE.

A TOWN or district with 35,000 inhabitants necessitates the disposal of about 300 tons of refuse per week. At present there are four ways of doing this. By "tipping" it on waste or out-of-the-way land and leaving it to rot and to breed and carry disease over some considerable area. It is an abominable and insanitary although largely-adopted system, is quite incapable of defence, and can naturally only be, at the best, of a temporary nature. By taking it away in barges or otherwise to some distant spot commonly known as a "tip" or "shoot," and paying for the privilege of inflicting the

"tipping" nuisance upon another district. By taking it, where possible, far out to sea in barges or "dumpers" and there "dumping" it in, to be washed ashore again by the first gale. This system has been much in vogue in New York, and it is found that even when taken out as far as fifty miles from the shore the bulk of the refuse is washed up again. By carting it to, and burning it in, a dust destructor. This is manifestly the best of the four systems; but, in spite of all that can be said in its favour by makers and other interested persons, still leaves much to be desired.

It cannot be too often insisted upon that dust destructors are by law a nuisance and liable to be injuncted and stopped at any time by desire of the surrounding inhabitants, a recent case in point being Lambeth, where a dust destructor erected at a cost of £36,000, has been condemned as a nuisance. The enormous initial outlay necessary to erect a destructor is also a great factor in restricting their adoption.

It is claimed that a satisfactory alternative as near sanitary perfection as possible, which shows a large annual profit instead of a heavy loss, and avoids the huge initial outlay necessary for a destructor, is offered by adopting the Pyrolytic converter system, the chief object of which is to convert instead of destroying floor-dust, house or other refuse into fuel for burning either in open grates, marine, railway, or other furnaces as a substitute for coal.

Briefly, as shown in the illustration here given, the *modus operandi* is as follows: The refuse is carted to the converter and shot upon a fixed sieve-floor 1½ in. mesh, most of the dust and very fine material falling through into a receptacle below. It is then roughly sorted by hand, all bottles, metals, leather, rubber waste, garbage, &c., being thrown into various side shoots provided for the purpose, the process facilitating the falling of dust through the sieve floor. What is left, consisting principally of paper, cardboard,

rags, cinder, wood, &c., is then pushed into a mill, which grinds the hard material to a powder, and tears and disintegrates the paper, rags, &c., the whole being thoroughly disintegrated during the operation principally by the addition of charcoal. The material then passes automatically into a mixing chamber, where it is mixed with various hydrocarbons, then into the moulds where a pressure of 4 tons to the square inch is brought to bear upon it, and the triquetres pass along on a running belt from which a low car takes and stacks them ready for use. Taken on an average, it is claimed that at least two-thirds of the entire refuse as received can be converted into fuel.

In the appended tables every effort is made to show the superiority of the converter over the destructor system, even allowing all refuse not convertible into best fuel to be carted away as valueless at an expense of 2s. 6d. per ton. The collection of refuse and carting to destructor or converter would necessarily be exactly the same, and need not, therefore, be taken into account.

The tables which now follow assume in each case a town of 35,000 inhabitants and the disposal of 300 tons of refuse per week. It is admitted that they will be found to vary considerably in different parts of the country, but it is claimed that they strike a very fair average, and endeavour to under- rather than over-estimate. It is also pointed out that the fuel is only estimated at 10s. per ton.

In London and the South of England generally it will, it is believed, command 12s. or 15s. a ton, as it is asserted to be far superior to any coal that can be purchased in London at the present prices.

ESTIMATED INCOME AND OUTGOING BY USING THE DESTRUCTOR SYSTEM.

Dr.	Per annum.	The annu.	£ s. d.
Cost of erecting destructor for 12,000 tons, 5,200 tons.	£ s. d.	Residue—one-third of 15,000 tons, 5,200 tons.	£ s. d.
Cost of burning 15,600 tons.	85 0 0	One-third of 3,200 tons useless, 1,733 tons.	
Labour, &c., at 2s. 6d.	1,350 0 0	3,467 tons saleable as clinker, ashes for mortar, &c., at 1s. per ton	173 6 0
(As per figures, Shore-ditch Destructor, 1898 and 1899)		The value of this 3,467 tons will vary from nothing at all in which case it is an extra expense to cart away to perhaps 2s. a ton in some exceptional and temporary cases, so that to allow for a ton all round and nothing on the debit side may be taken as fair average.	
Cost of carting away 1,733 tons at 2s. 6d.	216 12 6	Balance, being lost	2,473 6 6
			£2,646 12 6

ESTIMATED INCOME AND OUTGOING BY USING THE CONVERTER SYSTEM.

Dr.	Per annum.	Per annum.	£ s. d.
Cost of erecting converter for £2,500, interest at 4%	100 0 0	10,000 tons of the ingredients added, will give 10,000 tons of fuel, which, at only 10s. per ton 5,353 0 0	£ s. d.
Cost of labour sorting 15,600 tons at 2s. 6d.	381 0 0		
Cost of labour in fuel-making process, 10,000 tons at 7d.	363 6 8		
Cost ingredients for fuel, 10,000 tons at 2s. 6d.	1,300 0 0		
Cost carting away 5,200 tons at 2s. 6d.	650 0 0		
(It is anticipated that the bulk of this can be profitably dealt with as manure, hardware, metal, leather waste, &c., but 1s. shown here as an extra loss.)			
Balance, being profit	2,609 13 4		
	£5,353 0 0		£5,353 0 0

The figures given in the above table re the Converter System make no allowance for the considerable sum many towns would undoubtedly be

glad to pay to have the whole of their refuse taken off their hands, and are purposely put as unfavourably as possible.

But even on the basis the following figures give some idea of the possibilities of the "Hyrcin" in London alone, or with, for example, three of the home counties:—

Population.	Tons of Refuse per annum.	Profit per annum by Converter System.
26 London boroughs, 404,217.	1,862,925	£28,413
30 towns in Surrey, 343,000.	2,025,000	40,500
20 towns in Surrey, 414,000.	1,901,999	33,600
22 towns in Sussex, 389,000.	173,400	29,000
Showing a net profit of		£143,613

FACTORY CHIMNEYS.

THE art of chimney construction is one that has yet to be written. Questions are continually being asked about their construction, their proper sectional area, height, shape, and materials. The architect has not made it a study, though he may have a strong opinion of his own about the proper shape and outline of a structure of this kind. As a rule, the engineer of the factory is generally the individual interested in the erection of a factory chimney, and usually prepares his own design, unless he is better advised. Such a simple structure a factory chimney may not be considered to have any architectural claims, yet its proportions and outline are points which are appreciated. In a useful paper on "The Design and Construction of Factory Chimneys," by Mr. Francis Schumann, in the *Proceedings of the Engineers' Club of Philadelphia*, the author deals with the subject in a practical manner. The circular, octagonal, and square forms of chimney plan are stated to have the relative efficiency of 100, 97, and 90 respectively, and the area should be maintained throughout the height of flue, without reductions or enlargements. The dimensions are dependent on the kind and amount of fuel used, and the form and length of the ducts leading to the base of the chimney. The author refers to Pelet's and Rankine's theories, and observes their application to practice is attended with difficulties regarding the elements of friction and temperature, values which vary greatly with the form of furnace, grate, boiler, ducts, &c. &c. Empirical formulae have been used, and the author gives one that is said to agree very closely with actual results. We refer the reader to the paper for further information. The area found by the formula may be altered to suit different heights of chimney. The proportions apply to circular flues, and are ample for any kind of coal.

Remark on the construction, the author furnishes many useful hints. He says: "The outer form of brick chimneys is either circular, octagonal, or square in plan and pyramidal in elevation, the shape having a regular taper of about $\frac{1}{16}$ in. per foot; the diameter at the base, the inscribed circle of octagon or square, being between one-tenth and one-eighth of the height, the proportion being dependent upon the required stability and ratio of flue area to height." The shell enclosing the non-conducting inner lining should be of well-burned bricks of uniform size, laid in cement mortar. To insure close jointing, stretchers should preponderate—say, four courses of stretchers to one of headers. It is a good practice, he says, to bind the shell by iron bands or hoops made of tin, by tin bars riveted at the joints, these being built in with the bricks—about 8 in. intervals in the height. The bands are made in sizes to allow the line of one course of stretchers between the band and the outer surface of the shell, the space between the band and inner course of bricks being well filled and packed with mortar." The bands should come above or below a header course. The joints should be well packed with mortar to prevent the inflow of external air to the flue. The flue-lining should extend the full height of chimney, and in no case bond with outer shell except at the duct inlets, and an annular space of not less than $\frac{1}{16}$ in. should separate lining from outer shell. The bands should usually be laid of brick thick at the top, and gradually become thinner, and be held in position by projecting corbels of outer shell just touching the outer surface of lining, and allowing for movement due to expansion. The lower third of lining should be faced with fire-

brick laid in fireclay. Speaking on the stability of chimneys, a force of wind of not less than 50 lb. per square foot on a plane surface acting horizontally may be assumed. The author gives the proper procedure in designing and formulae for stability, which we have no space to quote here. The details and results given will be found of value to those intrusted with the construction of chimneys of this kind.

PUBLIC IMPROVEMENTS IN BIRMINGHAM.

CONSIDERABLE progress is, says the *Birmingham Post*, being made with the various public improvements which have been undertaken by the Public Works Committee of the corporation. The principal scheme is the reconstruction of the sewers—a project commenced about two and a half years ago, and will occupy attention for some few years to come. At the outset the city was divided into five districts, and reworking operations were commenced in Edgbaston and Harborne, a district which in this respect was the worst in Birmingham. In the reconstruction of the sewers in the locality it became necessary to lay down about 64 miles of new foul-water pipes, and in addition to this portion of the scheme was estimated at £155,000, and it was believed that the work would be finished in about four or five years. This estimate in regard to time and money, it is expected, will be well within the mark. Nearly two-thirds of the work has already been done. Some of the worst neighbourhoods have been finished, and at the present time the work is proceeding in Edgbaston Park-road, Hermitage-road, Westbourne-road, Norfolk-road, Harborne-road, Calthorpe-road, and some adjoining thoroughfares. A good deal of the work in the hands of contractors, but by far the most important part of the scheme is being carried out departmentally. As soon as the district is re-sewered the next work of the five districts will be taken in hand, and so the work will be continued until the whole of the city has been provided with new sewers. Another important item regarding the sewerage, and of the Public Works Committee is the construction of the Rea main sewer at Salfley. It runs from Montague-street alongside the river Rea through the land of the Midland Railway Company and the Gas Department to beyond Nechells Recreation Ground, a 6 ft. culvert in the tramways, and a 7 ft. culvert from that point to the terminus. The work has been in operation for more than twelve months, and may be completed within the next six months. Street and road improvements are in progress on every side of the city. Pritchett-lane, which connects the Bristol-road with Harborne, is to be straightened and broadened. The upper part of Broad-street has recently been relaid with wood, and the London and North-Western Railway Company are improving the bridge in Navigation-street which carries the thoroughfare over the railway from Hill-street to Fiddlers' the tramways, the chief matter on hand just now is the renewal of the cable line for a distance of about a mile and a quarter between Colmore-row and Hockley. When that route is completed the Bristol-road line will be taken in hand.

A use has, it is asserted, been found for another waste product by the utilization of the coke ashes of gasworks for the manufacture of bricks. The process of manufacture is very simple. The ashes are reduced to a fine powder, mixed with one-tenth part slaked lime, and after the addition of water, pressed into the mass forms a stiff paste. Then it is treated like ordinary clay, and formed into bricks by the use of suitable presses. The bricks are then stacked, protected from rain, and dried in the air, no artificial heat being used.

The New Streets Committee were able at their last meeting to advance a stage in street improvements affecting various parts of Bristol. The need of widening Ship-lane, Cathay, has been urged by memorialists, and the desirability of the improvement has been admitted. The committee say that it is proposed it would be necessary to cut off a considerable slice from the Ship Inn, and the committee requested the city valuer to negotiate with the Redcliffe Vestry and other leasees of the property affected in order that progress may be made with the work. The widening of White Ladies-road near King's-parade has been in hand for some time.

BOOKS RECEIVED.

A *Classed Catalogue of Printed Books on Heraldry* in the National Art Library at the Victoria and Albert Museum, has just been published in paper covers at 2s. by the Board of Education. London: Fyfe and Spalding, 10, Abchurch-lane. The book includes both English and foreign works, and takes the place of the alphabetical list under authors' names compiled 22 years ago by the late Mr. R. H. Soden Smith, and now out of print. The order adopted in the present catalogue, in the case of treatises, handbooks, and general collections of names, is in alphabetical order. The earliest pamphlet or memorial being placed first in its respective section, and the most recent last. Series of district or family armorials are grouped under the name of their particular districts or families, and follow one another in the alphabetical order of those names. Copious indices to authors and to subjects add greatly to the practical utility of the catalogue, which extends to 186 closely-printed pages, and has as an appendix 16 pages of illustrations of English, French, German, Italian, and Russian coats-of-arms.

CHIPS.

The Dublin Corporation have received letters from the Secretary of Public Works, stating that the Lords of the Treasury have sanctioned a loan of £254,000 for electric lighting purposes, and two smaller sums, amounting to over £1,000, for sewage works. Additional loans applied for to the amount of £11,000 were refused.

The Commissioners of the Northern Lighthouses have given notice that on October 1 next a light will be exhibited from a new lighthouse which has been erected on East Barmess, near Dunbar, Firth of Forth. The light will be a group-flashing white light, and will show the flash in quick succession every thirty seconds. The power of the light will be equal to about 78,000 standard candles, and will be seen seventeen nautical miles in clear weather.

A school at Glenlee, which has been erected by Hamilton Landward School Board in order to meet the educational needs of Burnbank and Greenfield, was formally opened last week. Less than three years ago Burnbank and Greenfield, which was now a colliery town, was literally green fields. In 1876 the first Board school opened, and consisted merely of two rooms. The building just opened is a two-storied structure, built of red Dumfriesshire stone. The central hall, which is surrounded by a balcony, is to be used for drill purposes. The classrooms, sixteen in number, are entered from the central hall on the ground floor and from the balcony on the upper floor. Every two classrooms are divided by sliding glass partitions so as to be converted into one for a collective lesson. The total has been £12,000, and accommodation is provided for 1,000 children.

A discussion took place at Monday's meeting of the school board for Oldham relative to a letter from the secretary to the local branch of the Operative House Painters' Society, protesting against the letting of a contract to a certain local contractor. Members pointed out that the "fair contracts" clause adopted by the board did not allow members to act on the premises of a contractor who was not a member of the board, but it did not enforce any penalty. The chairman (Canon Rountree), while agreeing with these remarks, thought they could not go to the length of making a "black list" of contractors. The thought home to any contractor, he thought it would be quite sufficient reason for no further contracts being given to him.

Mr. E. A. Abbey, R.A., has finally accepted the commission to paint a coronation picture. He came to him through Messrs. Agnew, who were in the first instance consulted on behalf of the King. It is a work involving large expenditure of time and labour than any possible fee commercially considered will cover. It is not only a scene reproduction of the coronation at Westminster Abbey, but the painting of hundreds of portraits, for which special sittings will have to be given.

The new sewerage works and sewage farm for the three parishes of Fletton, Woodstone, and Stunground, Hunts, provided at a cost of £22,000, was formally put into operation on Wednesday last week. The engineer was Mr. George Hosdon, of Loughborough, and the contractors were Messrs. Siddons and Freeman, of Oundle. Between five and six miles of sewers have been laid.

The school for Catholic blind children at West Derby, Liverpool, opened last week by Cardinal Vaughan, has been built from plans by Messrs. Simmott, Simmott, and Powell, of Liverpool, the contractor being Mr. Michael Fogarty, of Liverpool.

OBITUARY.

MR. WILLIAM YOUNG, senior partner of the old and respected firm of Messrs. Youngs and Sons, stationers, of Barnstable, passed away on the 15th inst., and was buried with every mark of public respect on the 19th inst. He had been fully thirty years parish clerk to the parish church at Barnstable, having succeeded his late father, who held a similar post for something like half a century. Mr. Youngs, who was in his 80th year at the time of his decease, was one of the old school of upright, honourable stationers, whose word was his bond, and who, by his genial manners and general *bon homie*, was justly a universal favourite. He was a man of handsome presence, and did excellent public work during a long life and residence in the western town of his birth. Amongst the jobs he was engaged in was the carrying-out of the stonework in the restoration and partial rebuilding of the ancient church of SS. Peter and Paul, Barnstable, under the late Sir, then Professor, G. G. Scott, R.A. see BUILDING NEWS, June 11, 1899. Blessed is he who, as he himself has been told, has the evening of his life easily and free from care, and his cheery greeting will be greatly missed by a large number of friends in North Devon. He leaves a widow and numerous family of children and grandchildren to mourn his loss.

At Plombières, in the Vosges, there was unveiled, on Sunday, a memorial to the handicraftsman Louis Francis, who was born there in 1814. He was one of the early companions of Missionner and Corot.

The Halifax School Board accepted on Monday tenders amounting to £7,683 2s. for building a new school for Copley district.

It may not be so generally known to the public as it is to artists that the studio of Mr. G. F. Watts, R.A., at his town residence, Little Holland House, Melbury-road, Kensington, is available for anybody on Saturday and Sunday evenings. As a collection of the painter's work is always on view at present including the famous "Paolo and Francesca" and a large number of portraits, in addition to subject pictures, of which some have been seen in public galleries.

The corporation of Sunderland have agreed that the electric tramways be extended (single line) down the High-street to the East End near the Birracks, at an estimated cost of £7,480 for laying the line and £10,000 for road alterations and paving, and that the tender of Mr. Samuel Warburton, of Manchester, for the erection of car sheds at Hylton-road, be accepted.

Seven memorial-stones of a New Connexion Church at Brighton, Canuck, were laid on Monday. The edifice is being erected on land adjoining the old chapel, built in 1855. It will be an ornate late 19th worshippers, and cost upwards of £4,000. The architect is Mr. A. Harrison, of Birmingham.

The sawmills and timber yards of Mr. Ogilvie, situate on the riverside at Grimsby, were totally destroyed by fire on Monday night.

Official announcement was made at Buckle, on Monday, that the Lords of the Treasury have agreed to contribute £5,000 towards the sum required for the construction of a new bridge at Grignon. The scheme entails the annexation of Portessee and district by the Borough of Buckle. The estimated figures submitted embrace a total cost of £15,000, of which £10,000 is in hand, exclusive of the Treasury grant.

Mr. William O. Humphreys, aged 21 years, an architect's clerk, of Bath, was drowned on Monday while bathing at Llandudno. When swimming in the bay, about forty yards from the shore, he was observed to sink. Several bathers who went to his assistance, and brought the body ashore. Medical evidence given at the inquest showed that he was smothered with a bit, and a verdict of accidental death by drowning was returned.

The Douglas Town Council decided, on Friday, to proceed next winter with the completion of the second section of the new drainage scheme. The section will cost £15,000, but the cost of the whole scheme is over £90,000. The special services in carrying out the work the borough surveyor was voted an honorarium of £10, and the assistant surveyor and the overseer £20 each.

The committee of the Devonian Club on the 20th inst. elected as hon. sec. Mr. C. H. Brodie, A.R.I.B.A., in succession to Mr. Geo. Ward, C.C., the founder and hon. sec. from the commencement, in 1891. Architects and their assistants who had from the Western shore are invited to communicate with Mr. Brodie at the Club, Adelphi Hotel, W.C.

COMPETITIONS.

HACKNEY.—A limited competition held a short time since for the Hackney Polytechnic has been settled. Mr. Thomas Blashill, F.R.I.B.A., being the assessor. The design of Mr. A. W. Cooke, A.R.I.B.A., has been accepted. The cost will be £50,000. The other competitors were Messrs. A. W. S. Cross, B.A., and Mr. E. W. Mountford, F.R.I.B.A. We hope to illustrate the work shortly.

HINCKLEY.—There were about one hundred responses to the advertisement for competitive plans for new club premises, including lock-up and a public-hall, to be erected on the Station-road, Hinckley. The awards were as follows:—Mr. W. T. Orson, Birmingham, 1st; Mr. William W. Wells, Leicester, 2nd; and Mr. Dakin, of Sileby, 3rd.

CHIPS.

At All Souls' Catholic Church, Peterborough, on Sunday, the blessing of a new high altar, together with a retables and baldachin, was performed. The design is by Mr. Leonard Stokes, the architect of the church, and the cost about £300. In the construction of the altar twelve varieties of marble have been used, and the retables is of carved oak.

The consecration of St. Paul's (Duke of Clarence Memorial) Church, Craigydon, Llandudno, by the Bishop of St. Asaph, will take place on September 4, when the church given by Lady Augusta M. Styn will be opened.

Mr. John Cassidy, sculptor, of Monmouth, has completed the memorial of the late Professor Tom Jones entrusted to him. It takes the form of a life-size medallion portrait in bronze. The medallion is now in the hands of the bronze foundry, and later on will be placed in the Medical School of the Owens College. The bronze will be placed upon a shield of English oak.

There were very few sales at the Tokenhouse-Market last week owing to the holiday season, and business was confined to three days. There was a fair demand for ordinary brick and mortar investments; but keen competition took place for a few choice lots at East Finchley, comprising three residences, five cottages, and half an acre of land in the High-road, which realised £5,365. The total sales at the Mart were £16,082.

Two new and important deposits of marbles have just been discovered in the Carrara district. The stone of the *Yellow Granite* is a fine, light-colored, finely marked in rose, black, and other shades. One of the deposits is at Groggans, already famous for the "pigeon's throat" marbles, and at Castelpeggio, rich in red varieties.

The city council of Manchester have decided to purchase certain properties required in connection with the proposed widening of Corporation-street. It has also been decided to purchase Heaton Park and to apply for sanction to borrow £121,150 for the purpose.

It was officially reported to the Dover Corporation on Tuesday by the town clerk that Parliament has granted them powers to deal with advertisement hoardings and sky-signs on the cliffs, and elsewhere in the town. These powers are retrospective, and the corporation will order the removal of objectionable cliff signs.

The corporation of Ipswich, at their last meeting, rescinded their previous resolution on the subject, and decided that the proposed generating station should be placed upon the site known as the Seven-Acre Field, adjacent to the cricket ground in Portman's Road. The plans for the buildings will accordingly be redrawn.

A permanent Ruskin Museum is to be opened at Clonmel, Lanes, on Saturday in next week, the 31st inst., as the result of a successful Ruskin Exhibition held there last summer. It consists of a large, well-lighted room in connection with the Constable Institute, and has been specially built and furnished for the purpose.

The urban district council of Clay Cross have accepted a scheme of sewage disposal prepared by Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham. The sewage will be treated laterally, the estimated cost being £5,000.

The town council of Carnarvon have resolved to engage Joseph de Courcy, consulting engineer, late borough surveyor of Barry, Lanes, to report as to whether the town-hall is such as will warrant the erection of a clock-tower thereon.

The Uganda Railway is rapidly progressing, although during the latter part of last year the works were retarded by a very heavy rain. The total length of the line is 685 miles. On March 31, 1900, railhead was at 362 miles. On March 31, 1901, railhead was at 483 miles. The line is expensive to work, but the cost is decreasing slowly.

PROFESSIONAL AND TRADE SOCIETIES.

Bristol and Gloucestershire Architectural Society.—The annual summer meeting of this society has been held this week at Chipping Gampen, the proceedings occupying from Tuesday to Thursday. Usually the proceedings have commenced with the business meeting, but on this occasion members proceeded on the opening day (Tuesday) to Evesham, where they were received by the vicar of the church of All Saints. Afternoon they also examined the church of St. Lawrence and the bell tower, which interesting buildings were described by Mr. H. A. Prothero, of Cheltenham. The church of Wickhamford was next visited, and then the party journeyed to Chipping Gampen, where the chairman and members of the local committee received the society at the town-hall. The business meeting followed. The report of the council was read and adopted, and the officers and members of the council elected, Sir Brooks Kay being appointed as chairman of council, and the retiring president (Alfred Fox, of Bristol) introduced his successor (the Earl of Gainsborough). The parish church, with its interesting monumental effigies, was examined, after which the party was received in the adjoining grounds of Old Gampen House by the Earl and Countess. Mr. Fox, of Bristol, was in the afternoon tea. The Grammar School and Market House were inspected on Wednesday, and in the evening there was a *conversazione* at the town hall, at which papers were read by Mr. E. Guy Dawber on "The Domestic Architecture of Gampen," Mr. Fox on "The Grammar School," and Mr. C. T. Davies on "The Brasses in Gampen Church."

At Coventry County Court on Tuesday Charles Henry Barber, formerly a builder in a large way of business in Coventry, applied for his discharge in bankruptcy. Mr. Lowe opposed on behalf of several creditors, and pointed out that just before applicant's bankruptcy he turned over his business to a relative, and that the discharge was suspended for three years.

For the proposed new hospital building at North Sydney, N.S.W., the committee have received 19 competitive designs. Messrs. W. L. Vernon, Government architect, J. R. Carey, and Dr. Norton Mansfield, are the successful competitors.

A new voluntary school, built at the expense of Miss Crosthwaite on a site given by the Earl of Lonsdale, was opened at Whitehaven last week by the Lord Bishop of Carlisle. The cost has been about £5,500, and the architects were Messrs. Oliver and Douglas, of Carlisle and London.

As the lease of the Congregational Mission House in Blomfield-street, E.C., will fall in the course of a few years, the directors of the London Missionary Society have secured a suitable site for the proposed new buildings. It is in New Bridge-street, and thus within a few minutes' walk of the Memorial Hall, the headquarters of the Congregational Union and kindred associations. The whole of the site of the property is about 10,000 sq. ft. and will not be required for only three years.

Workmen have begun to remove the coloured glass in the south transept window at Westminster Abbey, to make room for the new window in memory of the late Duke of Westminster. Great care will be taken to preserve the old glass. The Ordinary clear glass is being substituted, so that the work of putting in the new memorial window may ultimately be undertaken as a whole, and not done piecemeal as the old one is removed.

The foundation-stone of a new Roman Catholic church at Latchford, near Shrewsbury, was laid by the Bishop of Shrewsbury on Sunday afternoon. The new church, which will cost about £5,000, will be capable of accommodating 600 persons. The entire length will be 120 ft. the width 32 ft., and the height to ridge 60 ft. The clerestory is to be carried upon eight granite columns. All inside mouldings and dressings will be of red Runcorn stone, and the exterior will be of York stone with red stone dressings. The aisles are to be lighted by twelve two-light tracery-headed windows, the clerestory by twelve three-light tracery windows. The roof is an open pitched roof with a height of 25 ft. a gallery will be added at the west end. There will be a vestry connected with the presbytery by a cloister. The architect is Mr. Robert Curran, of Warrington, and the contractor Mr. P. McLuchen, of Birkenhead.

At a special meeting of the Swansea Corporation, Mr. Carl Prummern, borough electrical engineer, of Doncaster, was appointed to a similar position at Swansea. There were sixty applicants for the appointment.

Building Intelligence.

ILFRACOMBE.—The craft in general and the brethren of Lodge Concord, No. 1351, in particular may be congratulated on their new temple situated in the Tyndal-road. The front, of both stone and ashlar work, is classic in design, with the five orders of architecture intermixed. The four main columns supporting the entablature are of the Tuscan and Doric orders, and the six smaller columns, which flank the doorway and windows, are of Ionic, Corinthian, and Composite orders. The transoms of the pediment are decorated with the emblem of the square and compass, with date of erection. The lodge is entered by a lobby with black and tessellated pavement. A large ante-room is inside the front hall, from which the lodge is entered by two elaborately-decorated doors, each set upon panels, and the coats-of-arms of Devon and Ilfracombe. The ceiling, which is arched and divided into panels, is sky blue, on which are represented the constellations of the zodiac, while in the triangular panels near the dome are the northern crown, Herschell's telescope, Medusa's head, and the Dolphin constellation. The ceiling of the hall is decorated with Saturn, Jupiter, Mars, Venus, and Mercury. The walls are surmounted by a large cornice, neatly painted in cream, blue, and salmon colours. The frieze underneath is ornamented with various Masonic emblems. Around the lodge is a dado in red, with black panel lines, and fluted arches dividing, such as the coats of each panel, in blue and black, are tastefully painted the insignias of the respective offices. In the east of the handsome temple is an elaborate representation, in gold, of the rising sun, while in the south it is at its meridian, and setting in the west. The decorations were designed and executed by C. C. Clarke, P.M., 1351. The portraits of the Past Masters hung around the walls were the gift of Bro. E. D. Percival. The carving of the front is the work of Bro. J. P. Huxtable, I.G., 1351.

LANFAIR-IRIS.—The new public hall was opened on Tuesday week. It has been built for a private company, and next to the schools in the main street. The block of buildings contains on the first floor, a large hall, which is the main entrance to the hall, which is 98ft. extreme length and 50ft. wide inside. At the far end is a stage 25ft. deep, 15ft. of which is behind the drop curtain and 10ft. in front. Behind the stage is a passage communicating with two suites of dressing rooms. On the first floor is a room intended for use as a council chamber, and for other offices. All the works, &c., were designed by and carried out under the supervision of Mr. Richard Davies, architect, Bangor. The total outlay is £3,000.

LONDON, E.C.—In the recently widened thoroughfare between Fetter-lane and Fumival-street, known as Norwich-street, new printing premises have just been erected on the south side. The facade is of Portland stone relieved by red bricks, Burmanston glazed bricks being used for the lower part. The lower ground floor is used as a machine-room, and has a fireproof floor over. It measures about 61ft. by 96ft., and is 16ft. 6in. high. The walls are built of white glazed bricks, except at the lower part, where red glazed bricks are used. The floor is of concrete, and finished with granolithic paving. The staircase is inclosed with brickwork, and the steps are of concrete, finished with granolithic paving and Doulton treads. The walls of the lavatories on all other floors are covered with white glass tiles. Electric light is installed throughout the building, and narrow maple flooring, "secret nailed" has been used throughout. The ground floor is used as the publication department, and first three floors are arranged for the composing, reading, and other departments. The printing machinery occupies the whole of the top floor, and is fitted with the motive power for all the appliances. A lift communicates with all floors, from the machine-room to the stereotyping-room, and is propelled by electric current. Mr. Alfred Condor, of Westminster, is the architect. Mr. Henry Young, of Junction Works, Herne Hill, is the builder.

NAPSBUURY, HERTS.—At the Broad Sanctuary, Westminster, on Tuesday, Mr. E. A. Sandford Fawcett, an inspector under the Local Government Board, held an inquiry regarding the application of the Middlesex County Council for

power to borrow the sum of £250,000 for the purposes of the new lunatic asylum which they propose to erect at Napsbury, St. Albans, Herts. The Middlesex Council were represented by the architect Mr. Rowland Plumble, and the deputy clerk, Mr. W. G. Austin. There was no opposition to the scheme. Evidence was given to the effect that the asylum, which would be constructed to accommodate a total of 1,150 inmates, was estimated to cost £350,000. The loan of £250,000 for which consent was now asked, was on account only of the general building. The site had been already purchased at a cost of about £50,000, and the foundations for the main building were rapidly approaching completion. The whole of the quarter of a million of money would be expended on the general building, for which specific purpose the County Council was asking for the necessary borrowing powers. At the close of the inquiry, during which the system of drainage to be carried out, the lighting of the institution by electricity, the arrangement of the wards, and other matters of detail were described, the inspector intimated that he would make his report to the Council as soon as he could, and was possible, in order that the building operations might not be unduly retarded.

NORWICH.—New premises have just been erected in Red Lion-street, for the Norfolk and Norwich Savings Bank, from designs by Messrs. G. J. and F. W. Skipper, of Norwich, whose designs were accepted in a competition restricted to the architects of the city and county. The style adopted is that of the English Renaissance, freely treated, and adapted to the character of the buildings. Large plate-glass windows are provided on the ground floor, the masonry consisting of plain plinth, heavily rusticated doorways, and massive granite columns—all monoliths. On the first floor—where the board-room occurs—the windows at either end are designed with rusticated columns and pedimented entablatures. The intervening space is divided by pilasters, running up through two floors and capped with Ionic capitals, and the bays between these pilasters are filled with arched window openings, surmounted by curved swags of flowers and fruits, suspended from lions' heads. The second floor has a series of arched windows, and a central oriel window. A strongly-marked entablature runs along the front, carrying a solid stone parapet. At either end this entablature is stopped, and the cornice alone is continued through. Over the main entrance the pediment is broken and carried up in curved lines, and a panel having the name of the city is introduced. The whole is surmounted by three curved iron-shaped terminals. The banking hall is 33ft. 6in. long, 23ft. 6in. wide, and 16ft. high. The walls are lined with marble to about two-thirds of their height, and the windows and doors are arched over with the same material. The skirting and cornice moulding are of Bleu Belge marble, the pilasters are of Imperial Pavonazzo, the filling space between the pilasters is of Piastraccia, and the arches and keystones are of Vert des Alpes marble. The counter and other woodwork fittings are of mahogany, and the work of Messrs. Chamberlin, Sons, & Co. On the first floor is the board-room, 26ft. by 23ft., and 10ft. high. It also has an auditor's room. On the second floor are two storerooms and caretaker's apartments. The general contractors for the work have been Messrs. Scarles Bros., Queen's-road.

PERTH.—The dedication of the new buildings at St. Ninian's Cathedral, Perth, marks the completion of a scheme begun in 1850, when Lord Forbes and (the future) Lord Glasgow offered to build a cathedral for the united diocese of St. Andrew's, Dundee, and Dunblane, in Perth, the largest city of the diocese and the centre of the railway system. A sum of £6,000 was collected, and with this the choir and transepts of a small but dignified cathedral were built from plans by Mr. Butterfield, and consecrated by Bishop Forbes, of Brechin, in November, 1850. The choir and transepts were unfinished for thirty-eight years. At last, in 1885, it was decided to build the long-desired nave. This was done in 1890, at the cost of £8,000, from plans by Mr. Butterfield. On the death of Bishop Wordsworth in 1892 the Right Rev. G. H. Wilkinson, D.D., of Aberdeen, was unanimously elected, and under him £11,000 has been spent on the cathedral. From plans by Mr. F. L. Pearson the following works have been carried out:—(1) Aisles have been added to the chancel; (2) the choir has been extended internally across the

transepts; (3) new and handsome episcopal throne, canons' and choir stalls, and pulpit have been erected; (4) a chapter-house has been built as a memorial to Bishop Wordsworth; (5) vestries for Bishop, clergy, and choir; and choir building; (6) a cloister erected; and (7) the heating of the whole church reorganised.

PLYMOUTH.—A new grand stand has been built by the Earl of Morley on the Plymouth Race-course at Chelson Meadow. The stand has been built in its entirety by the workmen on the estate, under the direction of Mr. J. E. Holmes, Lord Morley's agent, and the plans of Mr. J. R. Swift, architect, of Truro. The stand is substantially built of limestone, with stucco cement facings, and beside the open stand at the top there are offices, &c., behind, and every part of the course can be seen with ease. The building will hold about 350 persons. There are two entrances, one at each end, and below the store-rooms for general purposes, lavatories for ladies and gentlemen, ladies' waiting-rooms, special offices for the secretary, stewards, gentlemen jockeys, professional jockeys, weighing-room—these last three are together, with the clerk of the scales' offices in the centre—and other second-class offices. A large bandstand and bandstand will be erected immediately between the two stands. A fresh paddock and offices are also about to be provided.

SHREWSBURY.—The Crown Hotel, at the corner of Castle-street, St. Mary's-street, has just been rebuilt in the local half-timbered style. Over the plain walls and windows of the ground floor stand on the many-paned bay windows, surmounted by carved gable ends. A notable feature of the front elevation is a monster wyvern, whose claws hold a shield bearing the name of the establishment, and from whose mouth is suspended a copy of an ancient horn lantern, for the electric light. Opening from the entrance-hall are a reading and writing room, inquiry and booking office, manager's room, and smoking-room bar. To the right of this is a dining-room, 38ft. by 22ft., capable of accommodating 100 people at dinner. On the first floor, in the main portion of the building, are the commercials' dining and reading-rooms. There are also three private sitting-rooms and two bedrooms, in addition to the rooms reserved for the use of the staff. The electric light, with gas in reserve, is fitted in all the sitting and bedrooms, as in the public rooms. Several suites of rooms, including a sitting-room and as many bed and dressing-rooms as required, can be separately let. On the ground floor two back and side rooms, and offices, kitchens, &c. The architect for the corner building was the late Mr. J. R. Withers, who also was responsible for a great part of the inside work, including the dining-room, whilst the adjoining elevation was designed by Mr. Sidney Gingsell, formerly, Shrewsbury, and Bickerton, of Shrewsbury, built the corner structure, and Mr. Nicholson, of Coleham, Shrewsbury, carried out the alterations in the old part of the hotel, and erected the new front facing the post-office. The decoration of the dining-room, ground floor, reading-room, hall, and bar was the work of Messrs. Cole and Sons, Shrewsbury.

ST. DAVID'S CATHEDRAL.—The Lady-chapel restoration, which has been so long contemplated, includes grained ceiling of Douling stone. The style adopted is the same as in the original: moulded ribs, started off the original old springers, there being the usual number of bosses and shields, on which are carved the arms of the bishops and deans. The outside roofing is of cast lead surrounded by a lead parapet, and there is a niche, in which has been placed a statue of the Virgin and Child. This is also of Douling stone. The pinnacle on each corner has also been restored. The flooring is of fine Portland stone and encaustic glazed tiles in squares, which give a fine effect. The ancient monument of Bishop Marmaduke Thomas was long since restored. The ante-chapel, situated between the Bishop Vaughan Chapel and the Lady-chapel, though seemingly detached from the cathedral, yet is not so. The ceiling and flooring have been renovated and restored where necessary. This present restoration has been carried out by Mr. William Thomas Haverford, contractor, under the superintendence of Mr. James Thomas, of the same place, the architect being Mr. John Oldrid Scott, F.S.A.

YARLEY.—A building, which is to serve as the offices of the Yarley Rural District Council, will be ready for occupation shortly. The materials

are thin red-sand bricks, with white points and dressings of Pilling stone. The windows are stone-mullioned, and have wrought-iron casements filled in with glass in broad leaded panes. The roof is covered with "olewood stone tiles, and is surmounted by a well-proportioned clock-tower, 80ft. high, with four openings 6ft. in diameter for clock-dial. There are two main entrances, one of which communicates directly with a stone staircase leading to the upper chamber and committee room on the upper floor. The council chamber is 50ft. by 26ft., and is arranged in the centre of the building. Two committee rooms, 32ft. by 20ft., are provided, one at each end of the council chamber, and are similarly treated. There are also provided, on the same floor, the chairman's private room, two retiring rooms, with lavatories, and the surveyor's drawing office with north light. At the rear of the office, and with an entrance to the side road, are placed the fire-station depot, mortuary, and caretaker's house. The fire-station has accommodation sufficient for two engines, stables for two horses, mess-room, and ambulance house. The depot consists of stabling for nine horses, two isolated horse-boxes, harness-room, mess-room, fodder-store, cartsheds, wheelwright's shop, smithy, store, and lamp-room, all included in a large yard. The mortuary has a north light and inspection lobby, with air-tight glass inspection window. The cost of the buildings is about £13,000. The architect is Mr. Arthur Harrison, of Colmore-row, Birmingham, and the work has been carried out by Mr. William Bishop, of King's Heath.

CHIPS.

The Cheltenham and district railway was opened for traffic on Saturday. It was designed and constructed by Messrs. T. Nevins and Son, the line extends from Lansdown Castle, on the extreme south-western side of Cheltenham, to the top of Lawrence Hill, 1,100ft. above the sea. The distance covered is 54 miles. The route through the town traverses Gloucester-road, St. George's-road, St. George's-place, and St. James's-square to the terminus Western Station.

Mr. R. Pearce, late municipal engineer, Penang, has taken charge of the office of municipal engineer, Singapore, *ex Mr. S. Tomlinson*, resigned.

The Coalbridge Dean of Guild Court have passed plans for a new school to be erected in Dunlanyuan at a cost of £5,500. The building will accommodate 620 children.

At the West Riding Police-court at Barnsley, on Friday, William Sykes Turner, tailor, of Wombwell, was charged with having erected a building without having previously submitted a plan. Turner resided in his own house, in Church-street, Wombwell, adjoining which was an ordinary waste passage. This he converted into a shop. Defendant alleged that it was not a building, and was erected in accordance with the council's by-laws, but the Bench held that it was, and inflicted a fine of 20s. and costs.

A Local Government Board inquiry was recently held into the application of the South Mims Rural £25,500 District Council for sanction to borrow for purposes of sewerage and sewage disposal for Potters Bar.

Mr. Thomas Robertson, who recently retired from the position of chairman of the Board of Public Works in Ireland, and who was at one time superintendent of the line on the Highland Railway, and thereafter general manager of the Great Northern Railway of Ireland, has been appointed a Director of Railways in India.

The development of the quarries in the neighbourhood of Burntland has led the lessee to devise means of railway connection as a substitute for the expensive carting to Burntland or Aberdare which was previously the practice. On Friday Messrs. Brown and Stoddart, of Great Quarry, one of the most productive freestone quarries in Fife, opened a railway, joining the main line at Colmswell. This service line will take a twelve-month to the coast, although the distance is only half a mile, the difference of level (about 300ft.) presenting some engineering difficulties.

In a case under the Workmen's Compensation Act which came before him at Colne, Lancs, on Friday, Judge Bompas held that the end wall of an existing house against which another building had been erected was not part of the building in course of construction. It would only become part of the new house when that was completed.

The colossal bronze statue of the late Duke of Devonshire, recently on exhibition at the Royal Academy, was unveiled at Eastbourne on Saturday by the Marquess of Abercromby. The statue is the work of Mr. W. Goscombe John, A.R.A. It represents the Duke as seated, attired in his robes as Chancellor of the University of Cambridge.

Engineering Notes.

EMERGENCY RAILWAYS FOR LONDON.—Following the report of the Joint Committee on London Underground Railways, the House of Lords passed a resolution to the effect that the promoters of eleven bills mentioned in that report have leave to suspend further proceedings thereon in order to proceed with the Bills, if they should think fit, in the next Session of Parliament, provided that notice of their intention to do so be given within a certain time. It has been officially intimated that notice has been given in the Private Bill Office of the House of Lords of intention to proceed with the eleven Bills in question. These measures are as follows:—Brompton and Fenchurch-street, the London Railway, Charing-cross, Eastern, and Hampstead Railway (No. 1 and No. 2), Charing-cross, Hammersmith, and District Electric Railway, City and North-East Suburban Electric Railway, Islington and Easton Railway, succeeded by North-East London Railway, and King's-road Railway, North-East London Railway, Piccadilly and City Railway, and West and South London Junction Railway.

At the London Bankruptcy-court an application was made on Saturday to Mr. Registrar Giffard for a receiving order against the estate of Mr. Alfred Gilbert, R.A., who has presented his own petition, describing himself as of 16, Mulberry-street, and receiving order was made. Nothing was stated as to the debts or assets.

Lieutenant-Colonel E. R. Kenyon, R.E., who has been Superintending Engineer at Devonport Dockyard for about five years, is retiring, and will be succeeded by Mr. W. W. J. Clarke, Superintending Civil Engineer at Chatham.

On Saturday afternoon Mr. R. W. Perks, M.P., formally opened the Alfred Bevan Memorial Convalescent Home at Sandgate. The institution was formerly controlled by the London Samaritan Society, and was afterwards utilised by the Government for the reception of wounded soldiers from South Africa. It has recently been acquired by the committee of the Morley Soldiers' and Sailors' Club, and is now at the cost of £15,000. The home provides 250 beds for workmen and their wives and children.

Mr. F. J. Whitaker, of Gilton, has been elected surveyor to the rural district council of Northamptonshire, from among 115 candidates. The salary is £225 a year.

To perpetuate the memory of Professor Binister Fletcher, C.S., J.P., a bursary has been established by the Architectural Association. It has been won by Mr. T. E. Green, who made drawings of Norden College, Blackheath; the south porch of St. Margaret's Church, Ipswich; and Brewers' Hall, Adle-street.

The long-projected extension of the electric railway system from Le Fayet to Chamounix has at last been successfully carried out, and a short hour in an electric car may now be substituted for the three hours' up-hill drive in the five-horse diligence which has hitherto formed the last stage of the journey to the top of Mont Blanc.

Mr. A. G. Gale, a Local Government Board inspector, has held an inquiry at the town-hall, Darham, in reference to an application by the city council for power to borrow £24, for the purpose of erecting an underground public convenience in the City-centre, near the Leodarders monument.

The Town City Council, at their meeting on the 13th inst., adopted the recommendation of the sanitary committee that the services of Messrs. Beesley, Son, and Nicholls, of Westminster, be retained as engineers in the preparation of a scheme for the interception and disposal of the sewage of the city. The committee had no less than 47 applications under consideration.

The district council of Malvern has just accepted the tender of Messrs. John Smith and Sons, Molden Road, Derby, for a large clock with four dials, to be erected on the Morris Tusk, and the same firm are also making a large clock with four dials for the Salford Cemetery.

The town-hall, Oakham, is being warmed and ventilated by means of Shorland's patent exhaust-rod patent exhaust-rod ventilators, and special inlet-tubes, the same being supplied by Messrs. F. H. Shorland and Brother, of Manchester.

Messrs. W. Potts and Sons, Leeds, have received instructions from the Queen Victoria Memorial Committee to erect a new set of bronze statues to be placed in the tower of Gisleburgh's ancient parish church. Messrs. Potts and Sons are also making a Cambridge quarter-chime clock, with three external illuminated dials, for the parish church tower, Saltern-by-the-Sea.

WATER SUPPLY AND SANITARY MATTERS.

ABERDEEN.—An interesting engineering work in connection with the large sewage scheme which the corporation of Aberdeen has at present on hand is about to be commenced in the formation of a conduit which will pass under the Dee on a viaduct, and the outfall at Glenelg lighthouse. This tunnel will be about 30ft. beneath the bed of the river, and will consist of cast-iron cylinders, 7ft. 6in. in diameter, with steel diaphragms. The land portion of the sewer will be made of brick and concrete, and it will have to pass through heavy rock cutting as it nears the sea, which it enters at about 500ft. south of the lighthouse. The contract for this section of the sewer has been awarded to Messrs. J. and the successful contractor is Mr. Peter Twiss, Aberdeen.

EDINBURGH WATER SUPPLY: COLLAPSE OF A TUNNEL ON THE TALLA WATERWORKS.—An accident in connection with the construction of the Talla Waterworks was brought to the consideration of a sub-committee of the Edinburgh and District Water Trust on Tuesday. About two miles on the Edinburgh side of the reservoir the aqueduct which will bring the water into the city from the Talla takes the form of a long tunnel, which is being constructed by Mr. Best, contractor, under the directions of the Water Trust engineer. Unfortunately a large part of this tunnel has collapsed, owing, it is considered, to the pressure of underground water which had gathered to such an extent on the hillside of the tunnel as to overcome the resistance of the tunnel wall. In the making of the tunnel a great deal of water was encountered, and it was thought that inadequate provision had been made for allowing it to escape both over and under the aqueduct. Before the damage is repaired the expense will not be less than £15,000, or £20,000, and the collapse have disabled without in the mean time fixing liability upon any of the parties concerned, to ask Mr. Hill, C.E., Manchester, who has acted hitherto as consulting engineer to the Trust in connection with the reservoir, to make a report on the cause of the mishap, and, at the same time, to examine the other works now in progress.

The Earl of Mount Edgumbe will, on Sept. 15, unveil the monument which is being erected in the Victoria Park, at Saltash, by the county of Cornwall, in memory of the late General Sir William Penn Symonds, one of the first victims of the Boer campaign.

The new Castle of Kildrumna, which has been in course of erection for the past two or three years, from plans by Mr. A. Marshall Mackenzie, A.R.S.A., of Aberdeen, is now almost completed. Consequently the new house of the Earl of Sutherland and the construction of a stone bridge which brings the old and the new castles into direct communication, the owner, Mr. James Ogston, has taken measures to preserve the antiquity of the new building as English architecture in character.

On Sunday week the reopening took place of the Lady-chapel at St. Mary's Roman Catholic Church, Derby. The work of decoration has been carried out by Mr. Joseph A. Pippet, of Solihull.

The council of the University of Birmingham have decided not to adopt the project of inviting competitive designs for the proposed buildings to be erected in Edgbaston Park-road, but have intrusted the work to Messrs. Aston Webb and Ingress Bell, of London.

The new Roman Catholic Church of St. James, Cashin, was solemnly dedicated on Sunday by the Most Rev. Dr. McEvilly, Archbishop of Tuam. The church, built from plans provided by Mr. T. J. Hamilton, of Galway, is designed to accommodate 1,000 persons, and the building and its erection have been carried out under the direct supervision of the parish priest. The fabric is now practically complete, but the small tower and the interior decoration still remain to be completed.

Sanction to the borrowing of £12,000 for the purposes of the new police office has been obtained by the urban district council of Broadstairs, Thanet.

The municipal buildings at the corner of Charing Cross-road and St. Martin's-place, known as St. Martin's Town Hall, and built from plans by the late Mr. Robert Taylor, are being extended by the addition of an upper story and the carrying back of the premises. The outlay will be about £10,000.

In the case of an application for discharge from bankruptcy on behalf of John William Goodall, Field-road, Forest Gate, E., builder and decorator, the order of discharge has been made for three years, and the discharge is dated 19th Dec. 1901. It is that on behalf of William Jenkins, Port Talbot, Glamorganshire, builder and contractor, the order of discharge has been suspended for six months, ending Jan. 1, 1902.

An isolation hospital is about to be built for the Cuckfield Rural Sanitary District. The estimated cost of £12,000. Mr. G. H. Hine, of London, is the architect.

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ILLUSTRATIONS.

THE NEW GAIEITY THEATRE AND "MORNING POST" OFFICES
IN THE STRAND.—CORNWALL LUNATIC ASYLUM, BODMIN.—
—INTARSIA PANELS FROM CHOIR STALLS AT MILAN.—
RESIDENCE AT CAMBRIDGE, N.Y.—SECOND PRIZE
DESIGN FOR THE HERFORD NEW MUNICIPAL BUILDINGS.
—TEMPORARY PREMISES FOR SHORTS, LIMITED, IN THE
STRAND.

Our Illustrations.

NEW GAIEITY THEATRE AND "MORNING POST" OFFICES.

This drawing, together with Mr. Runtz's whole scheme for the Strand building, formed a very conspicuous exhibit at the Royal Academy this summer. We shall publish the more comprehensive view next week. The accompanying design embraces the Gaiety Theatre and the proposed new offices for the *Morning Post*. The foundations for the former building are now being prepared with, but the design in course of execution has been modified, with a further assistance, we understand, of Mr. R. Norman Shaw, R.A., as consulting architect, with whose design it is said the London County Council is well satisfied, though it is not clear to what extent the entire plan for rebuilding the north front of the Strand will be affected by what has done. It is evident, however, if the original idea embodied in the late competition for designs is to be realised, that the scale and character of the whole should be in harmonious conformity with so prominent a portion of the facade as the New Gaiety Theatre and Restaurant, as it is at the west end and where the best unobstructed view of its extent will be obtained. The drawing now given affords a good idea of the conspicuous character of the particular portion in question, and illustrates really Mr. Runtz's original design, of which we published elevations and plans in the *Building News* for November 9, 1900, at the time we illustrated the whole of the competition designs by Messrs. E. W. Mountford, Ernest George, Stokes and Richards, Mervyn Macartney, H. T. Hare, and Reginald Blomfield. Subsequently it was stated that the design by Mr. H. T. Hare had been determined upon by the London County Council, but whether this is to be adhered to seems doubtful, and we learn that Mr. W. E. Emson has prepared plans for Curr's Restaurant at the other end of the Strand, where the new facade will terminate near the Royal Courts of Justice. Messrs. Short and Co.'s new premises form part of Mr. Runtz's block. Their temporary premises, on the site of the demolished "Coach and Horses" will for some few years form a prominent object in the Strand, standing up like a tower near St. Mary's Church. It is already nearly completed, and has the merit of some degree of artistic character, which, for a temporary erection, appears to be worthy of recognition, and therefore we give a view in this connection. All the schemes for the upper portions, with a view to economy, have been selected from the old buildings on the adjacent sites now demolished, and also the old trusses and mouldings have been reused wherever practicable. The half-timber work is made out

of the old floor-boards of the front portion of the premises, which was erected only a few years ago. The ground-floor front is entirely new, and looks suitable for an historic shop-front, being more after the style of an old tavern. It is done in deal, and a considerable part of the front is finished in roughcast. Green slates are employed for the roof seen from the Strand. Messrs. Ernest Runtz and Co., the architects, have certainly made the most of the opportunity to produce a picturesque and telling effect.

CORNWALL LUNATIC ASYLUM, BODMIN: PROPOSED EXTENSIONS.

The accompanying illustration gives a view of the new buildings as they will appear when completed, from the plans of Mr. A. Stevens Trevall, F.R.I.B.A. The present asylum does not show in this view, as it is some distance from the site selected for the new buildings. The entire group will be about 700ft. long by 400ft. in depth, comprising in the centre as approached from the south-west a residence for the assistant medical officers, clerical, porters' rooms, waiting-rooms, and stores. From this a wide corridor leads to pathological rooms, and the main dining and recreation-hall. This hall, which measures over 100ft. long by 45ft. wide, with a stage 20ft. deep, is connected with the kitchen and all the patients' blocks by covered corridors. At the rear of the hall is the kitchen and attendant block, and behind this the workshop block. To the right of the asylum medical officer's residence is the sick and infirm block, providing accommodation for 126 patients, and on the corresponding position to the left the recent and acute block, providing accommodation for 100 patients. Beyond this, to the left, is the chronic block for 78 patients, and in the corresponding portion on the right the epileptic block for 90 patients. Each of these blocks contains the regulation day-rooms, dormitories, single rooms, dining-rooms, sculleries, attendants' rooms, stores, sanitary blocks, bath-rooms, and fire-proof cellars and staircases, giving alternative means of escape in case of fire. The workshops comprise accommodation for the different trades required in the establishment; and here the inmates are enabled to earn something towards their maintenance. In the boiler-house and engine and dynamo-rooms provision is made for the machinery and appliances required for heating, ventilating, and lighting. The buildings throughout will be solid and substantial, but plain. In the matter of average cost per bed, the building at Bodmin works out, according to the accepted tender, at £220 per bed. The cost of recent asylums compares as follows: (Croydon, £230; Crampton, £220; £305; Middlesex, £320; Hertford, £207; Claybury (London), £271; Horton (London), £246. In the last two cases the asylums were for 2,000 patients each, which enables a lower relative average to be obtained than can be the case with smaller buildings. This, coupled with the fact that the administrative offices at Bodmin are ample for additional blocks of 200 or more patients, would bring Mr. Trevall's result back to less than £200 a bed were the comparison on equal terms.

INTARSIA PANELS FROM THE CHOIR STALLS IN SANTA MARIA DELLE GRAZIE, MILAN.

The choir of the abbey church of S. Maria delle Grazie, along with the dome and transept, are usually ascribed to Bramante, and date from 1492. In default of direct evidence, the design of the stalls may well be attributed at least to his influence. A Italian work of this class and period goes, the stalls before us may be characterised as extremely simple in design. The detail of mouldings, moreover, is rather wanting in refinement when compared with other examples. This comparative simplicity, however, is manifest throughout the work, and in the intarsia panels used for the transepts depending on the contrast and combinations of few woods evidently selected with very special attention to the quality of the "chamf" and grain. The drawing of nearly all the designs is strong and big in feeling, and the joints (which are no "hair-cracks") are filled in with a new, or a decidedly green tint, but presumably black when fresh. In these respects the contrast between this work and such a famous example as the stalls of St. Maria in Organo, Verona, executed in 1499, is to the prejudice of the latter. Undoubtedly Fra Giovanni, the Verona artist, has shown far greater mastery of

technical delicacy; but his marvellous skill has been a pitfall to him in the matter of design. The perspective and sculpture in his work reveals an incapacity to deal with curves and charming to a degree; but the sacrifice of breadth and decorative quality is absolute. In our Milan example there is not a panel that may not be appreciated in the general view and not a tint that jars. The main parts of the joinery and the bed veneer are of walnut, the arms, trusses, and sloped portions being of ebony, carved, with simple sunk relief ornament. The stiles and rails are embellished with lines in box and ebony, while geometric enrichments occur on the vertical divisions. The ornament in the frieze and in the panels of the soffit is in boxwood only. The accompanying drawings, of the interior panels and general measured sketch are by Mr. Peter E. Nobbs, M.A., A.R.I.B.A., who was awarded a medal of merit in the Owen Jones Studentship Competition last winter for a series of studies of which these formed a part. A sketch of the dome and transepts by Mr. J. Taveron Perry, of this great church, Santa Maria Della Grazie, published in the *Building News* for November 9, 1888.

HALL TO RESIDENCE, CAMBRIDGE, NEW YORK.

This hall, illustrated from a drawing sent us by the architect, is about 3½ ft. square, occupying the entire front of the house, and is used as a living room as well as for receptions. The floors are of hard wood, and all the interior woodwork is of white enamel, except the treads and hand-rails. The doors are finished in mahogany. Mr. F. R. Constock, of New York City, is the architect.

HERFORD MUNICIPAL BUILDINGS: SECOND SELECTED DESIGN.

We published the selected design for these buildings in the *Building News* for August 9. Today we illustrate the design placed second by the Corporation in the choice which the authorities made from the 46 plans submitted. It will be remembered that the designs awarded the premiums by the professional referee, Mr. Thomas Binsham, M.A., were submitted to the Corporation by Messrs. Morley and Son, of Bradford, are the authors of the scheme of which we give the view and two principal plans to-day. These show the general arrangements. The facade was intended to be carried out in buff terra-cotta, with red terracotta facings to the walling. Hard wood fittings were contemplated for the interior treatment of the chief apartments. The council room measures 40ft. by 30ft., and the assembly hall 60ft. by 37½ ft., giving the required areas. One of the main essentials of the scheme was that the committee rooms and chief officers' rooms should be removed from the noise of the street. We have no doubt that the architectural designs in this somewhat unfortunately-managed competition from all parts of the country, and regret that space will not enable us to give drawings of the rejected proposals.

The corporation of Stockport have decided to proceed with the first part of the Kinder Scout scheme of water supply under the Bill now awaiting the Royal assent, the estimated cost of such works being £23,500, exclusive of engineering works and contingencies, £49,430, and £11,000 for land. The engineer estimates that the works would occupy eight or nine years under ordinary conditions.

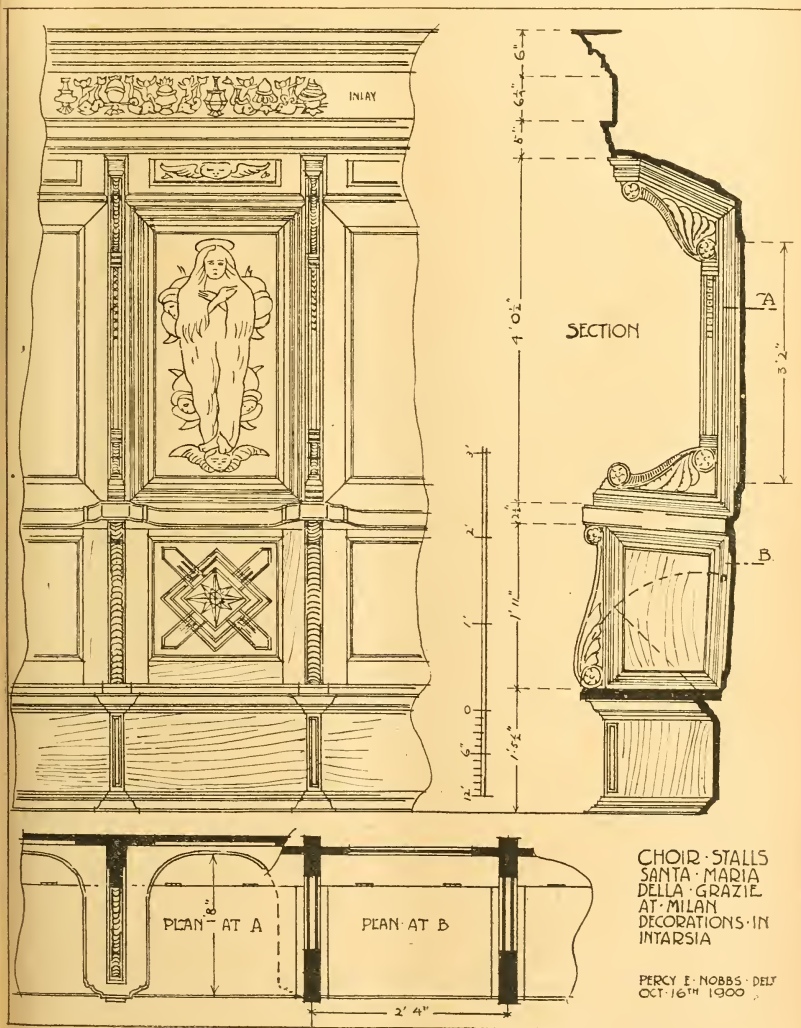
At Weston-super-Mare a manifest improvement has been completed this week in the widening of the Marine Parade at the rear of Claremont Crescent. The work has been carried out for the urban district council from plans prepared by the town surveyor, Mr. Hugh Nettleton, who has given the work his personal supervision. The congested state of this portion of the Marine Parade was often a source of inconvenience. Formerly the parade at this point was only 10ft. wide in the narrowest part, but now the narrowest section will have a width of 26ft.

The annual report of the Whitworth Institute at Manchester, presented last week, states that the president (Sir William Agnew, Bart.) had presented during the year an oil painting, entitled "Roderick Random" by Mr. C. R. Leslie, R.A., and a portrait of the late Sir Edward Bouverie-Jones. The donations included a book, "The Shipwreck of the 'Home,'" by G. P. Panunzi (1750). During the year the council had purchased the following works of art:—"The Valley of the Great," by Keely H. Swell, F.R.S.A.; "Sitting," by John G. Thomas, Cresswell, R.A.; and water-colour drawings—"The Timber Wagon," "Carnarvon Castle," and "A Highland Loch," by Paul Sandby, R.A.

* See small illustration of stalls and lectern in the *Building News* for Dec. 25, 1896.



TEMPORARY PREMISES FOR SHORTS, LIMITED, IN THE STRAND.



LIST OF COMPETITIONS OPEN.

Recessals—Alterations to Church		The Rev. T. Houghton, F. Edesall Vicarage, Shetfield	Aug. 31
Penance—Laying-out Ground on Western Promenade	£21 merged, £10 18s.	H. R. Cornish, Town Clerk, Public Buildings, Penance	Sept. 1
Blackpool—Laying-out Land at Cemetery	£30, £15, 5s.	The Borough Surveyor, Town Hall, Blackpool	Sept. 16
Palace, S.W.—Palace, S.W. King's-road	50s., merged, 50s., 3s. 6d.	The Public Baths Committee Office, 171, King's-road, Chelsea, S.W. Oct. 1	
Camberwell, S.E.—Baths and Washhouses, Old Kent-road			
(A. Saxton Spill, F.R.I.B.A., Assessor	150s., 75s., 50s.		
London, N.W.—R.N. Society's New Offices, etc.		The Town Clerk, Town Hall, Camberwell, S.E.	29
Easton-road limit £45,000	£100 merged, £75, 45s.		
St. Peter Port, Guernsey—School 759 places		Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, Adelphi, W.C.	Nov. 15
Walford—Walford—Walford—Walford	£34, £20, £10 10s.	The Rev. G. E. Lee, Rector, St. Peter Port, Guernsey	
Chapel—Chapel, Cathedral-road, cost £5,000		D. G. C. Webb, U.C. 6, 108, Cannon-st., London, E.C. 4	
		Thomas Evans, 102, Cathedral-road, Cardiff	

LIST OF TENDERS OPEN.

BUILDINGS.

ard-Bottle-Washing Shed and Stores at Distillery	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeoman, M.S.A., Architect, Chard	Aug 24
Belfast-Entrance to Presbyterian School	Electricity and Tramways Committee	Langtry Withers, The Square, Colmer	25
Belfast-Electric Light Station, Charles-street		B. Hall, A.M.I.C.E., Borough Engineer	26
Belfast-Entrance to Stores at Shipyard		Wardlaw and Co., 10, The Mall, Nelson	27
Belfast-Entrance to Stores at Shipyard	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeoman, M.S.A., Architect, Chard	28
Belfast-Entrance to Stores at Shipyard	Golf Club	W. Walsh & Co., 10, The Mall, Nelson	29
Belfast-Entrance to Stores at Shipyard	Corporation	T. Roderick, Architect, Ashgrove House, Aberdeen	30
Belfast-Entrance to Stores at Shipyard		S. Gibson, Architect, 4 Gray's Inn-square, W.C.	31
Belfast-Entrance to Stores at Shipyard		F. M. Mulveny, Architect, 10, The Mall, Nelson	32
Belfast-Entrance to Stores at Shipyard		Arthur W. Yeoman, M.S.A., Architect, Chard	33
Belfast-Entrance to Stores at Shipyard		John F. Shelly, Clerk, Board Room, Callan	34
Belfast-Entrance to Stores at Shipyard		Henry Robert, Architect, 10, The Mall, Nelson	35
Belfast-Entrance to Stores at Shipyard		J. Williams, Clerk, 1, High-street, Cardigan	36
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Belfast-Entrance to Stores at Shipyard		Henry Robert, Architect, 10, The Mall, Nelson	38
Belfast-Entrance to Stores at Shipyard		John McCarry, Architect, Stranlarai	39
Belfast-Entrance to Stores at Shipyard		Herbert Shaw, A.M.I.C.E., 7, Cranbrook-road, Iford	40
Belfast-Entrance to Stores at Shipyard		W. Walsh & Co., 10, The Mall, Nelson	41
Belfast-Entrance to Stores at Shipyard		Wm. Crawford, Clerk, Linavady, Ireland	42
Belfast-Entrance to Stores at Shipyard		William Alexander, City Architect, Dundee	43
Belfast-Entrance to Stores at Shipyard		Samuel F. Hynde, 21, South Hall, Cork	44
Belfast-Entrance to Stores at Shipyard		M. J. McMillen, B.E., 24, South Hall, Cork	45
Belfast-Entrance to Stores at Shipyard		E. E. Clephan, Architect, St. Nicholas Chambers, Newcastle-on-Tyne	46
Belfast-Entrance to Stores at Shipyard		H. Scott, Borough Engineer, South Hall, Cork	47
Belfast-Entrance to Stores at Shipyard		William Stubbs, A.M.I.C.E., Borough Engineer, Blackburn	48
Belfast-Entrance to Stores at Shipyard		L. J. Vatt, Surveyor, Council Offices, Chapel-street, Gloucester	49
Belfast-Entrance to Stores at Shipyard		H. Parkinson, Clerk, Old Bank Chambers, Bradford	50
Belfast-Entrance to Stores at Shipyard		Alex. Smith, Engineer, Gasworks, Cotton-street, Aberdeen	51
Belfast-Entrance to Stores at Shipyard		James & Mackenzie, Engineers, Scottish Provident Buildings, Belfast	52
Belfast-Entrance to Stores at Shipyard		Maxham Lee, Clerk, 10, The Mall, Nelson	53
Belfast-Entrance to Stores at Shipyard		C. Brownridge, A.M.I.C.E., Baro' Eng., Town Hall, Birkenhead	54
Belfast-Entrance to Stores at Shipyard		H. Miller, A.M.I.C.E., Falling	55
Belfast-Entrance to Stores at Shipyard		Joseph O'Dwyer, Architect, 10, The Mall, Nelson	56
Belfast-Entrance to Stores at Shipyard		Rowland Kinnear, F.R.I.B.A., 31, Fitzroy-square, W.	57
Belfast-Entrance to Stores at Shipyard		Henry J. Plue, Town Clerk, Municipal Offices, Wigan	58
Belfast-Entrance to Stores at Shipyard		S. Gwyn P. Jones, B.A., 34, 1/2, Fitzroy-square, W.C.	59
Belfast-Entrance to Stores at Shipyard		J. G. Weeks, Bedford	60
Belfast-Entrance to Stores at Shipyard		Frederick W. Rulledge, Architect, Clifton-gardens, Gales	61
Belfast-Entrance to Stores at Shipyard		Frederick W. Rulledge, F.R.I.B.A., Borough Chambers, Dewsbury	62
Belfast-Entrance to Stores at Shipyard		Newman & Newman, Architects, 21, Tooley-st., London Bridge, S.E.	63
Belfast-Entrance to Stores at Shipyard		John Bowen, A.M.I.C.E., Borough Engineer, Town Hall, Reading	64
Belfast-Entrance to Stores at Shipyard		John Kirk and Sons, Architects, Huddersfield	65
Belfast-Entrance to Stores at Shipyard		Jas. Cowan, Surveyor, Egremond	66
Belfast-Entrance to Stores at Shipyard		Thomas Winn and Sons, Architects, 25, Albion-house, Hatnagar	67
Belfast-Entrance to Stores at Shipyard		Charles E. Oliver, Architect, General Offices, Consett	68
Belfast-Entrance to Stores at Shipyard		The Baglan Hotel, Treherbert, Wales	69
Belfast-Entrance to Stores at Shipyard		Thomas Winn and Sons, Architects, 25, Albion-street, Leeds	70
Belfast-Entrance to Stores at Shipyard		J. B. Morgan, M.S.A., Llandly	71
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Belfast-Entrance to Stores at Shipyard		F. N. Haswell, F.R.I.B.A., 25, Albion-street, North Shields	73
Belfast-Entrance to Stores at Shipyard		Peak and Lunn, Architects, 36, high-street, Guildford	74
Belfast-Entrance to Stores at Shipyard		J. Cresswell, County Architect, Moothall, Newcastle-on-Tyne	75
Belfast-Entrance to Stores at Shipyard		T. Duncombe Mann, Clerk, Lambank, E.C. 4	76
Belfast-Entrance to Stores at Shipyard		M. A. Robinson, M.R.I.A.I., Richmond-street, Londonbury	77
Belfast-Entrance to Stores at Shipyard		John Robinson, Architect, Wombwell	78
Belfast-Entrance to Stores at Shipyard		The Rev. Wm. Dick, Clerk, Lambank, E.C. 4	79
Belfast-Entrance to Stores at Shipyard		T. Duncombe Mann, Clerk, Lambank, E.C. 4	80
Belfast-Entrance to Stores at Shipyard		John Robinson, Architect, Wombwell	81
Belfast-Entrance to Stores at Shipyard		Leat, A. C. H. Parsons, R. L. Lorraine, Beilmuller	82
Belfast-Entrance to Stores at Shipyard		John Robinson, Architect, Wombwell	83
Belfast-Entrance to Stores at Shipyard		The Secretary, Park Hotel, Cawnpore	84
Belfast-Entrance to Stores at Shipyard		A. J. Simpson, A.M.I.C.E., 10, Market, Suffolk	85
Belfast-Entrance to Stores at Shipyard		A. J. Wood, Architect, 22, Surrey-st., Victoria Embankment, W.C. Sept.	86
Belfast-Entrance to Stores at Shipyard		Thos. H. Mitchell, Architect, Strand, Tadmor	87
Belfast-Entrance to Stores at Shipyard		Atkin and Hill, Architects, 25, Albion-street, North Shields	88
Belfast-Entrance to Stores at Shipyard		Richard Creed, F.R.I.B.A., 11, Fitzroy-square, E.C.	89
Belfast-Entrance to Stores at Shipyard		James M. Kenzie, Clerk, Kirkcaldy	90
Belfast-Entrance to Stores at Shipyard		Atkinson and Hogg, Architects, 25, Albion-street, North Shields	91
Belfast-Entrance to Stores at Shipyard		The Company's Engineer, Buchanan-street Station, Glasgow	92
Belfast-Entrance to Stores at Shipyard		The Office of Public Works, Dublin	93
Belfast-Entrance to Stores at Shipyard		Bedford and Kitson, Architects, Green-street Chambers, Leeds	94
Belfast-Entrance to Stores at Shipyard		Bedford and Kitson, Architects, 25, Albion-street, North Shields	95
Belfast-Entrance to Stores at Shipyard		G. E. T. Laurence, Architect, 22, Buckingham-st., Adelphi, W.C.	96
Belfast-Entrance to Stores at Shipyard		The City Engineer, Municipal Buildings, Leeds	97
Belfast-Entrance to Stores at Shipyard		Owen, Architects, 25, Albion-street, North Shields	98
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LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Roller-Iron Joist, Belgian	£3 0 0	£3 10 0
Roller-Steel Joist, English	6 10 0	6 15 0
Wrought-Iron Girder Plates	7 15 0	7 15 0
Bar-Iron, good 8½ in.	6 15 0	8 10 0
Do, Lowmoor, Flat, Round, or Square	20 0 0	20 0 0
Do, Welsh	23 10 0	5 17 6

Boiler Plates, Iron		
South Staffs.	10 0 0	10 0 0
Best Newcastle	12 0 0	12 0 0

Anglo-Iro. Tees 2b, per ton extra.

Builders' Hoop Iron, for bonding, &c. £6 15s.
Builders' Hoop Iron, galvanised, 15 to 16 oz. per ton.

Galvanised Corrugated Sheet-Iron.

	Per ton.	No 22 to 24.
6ft. to 8ft. long, inclusive	Per ton.	Per ton.
range	£11 5 0	£11 12 0
Best ditto	11 15 0	12 12 0

	Per ton.	Per ton.
Cast-Iron Columns	£8 10 0	£8 10 0

Roller-Iron Stanchions	6 10 0	8 10 0
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Roller-Iron Fence Wire	6 10 0	8 10 0
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Cast-Iron Sash Weights	8 0 0	8 5 0
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Cut Chain Nails, 3 to 6 in.	9 15 0	9 15 0
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Cut Floor Brads	9 10 0	9 10 0
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Wire Nails (Points de Paris)		
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0 to 7 8 9 10 11 12 13 14 15 B.W.G.		
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0 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		
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Cast-Iron Sockel Pipes—		
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3 in. diameter	£3 15 0	£6 0 0
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4 in. to 6 in.	5 12 6	5 17 6
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7 in. to 24 in. all sizes	5 0 0	5 5 0
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Galvanised with composition, 3s. 6d. per ton extra; turned and bored joints, 3s. 6d. per ton extra.		
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Pig-Iron—		
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Cold Blast, Lillishall	100s. to 112s. 6d.	
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Hot Blast, ditto	65s. 6d. to 70s. 6d.	
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Wrought-Iron Tubes and Fittings—Discount off Standard		
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Gas-Tubes	70s. p.c.	
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Water-Tubes	65	
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Steam-Tubes	60	
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Galvanised Gas-Tubes	92	
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Galvanised Water-Tubes	92	
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Galvanised Steam-Tubes	47s.	
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10cwt. casks, 5cwt. casks.		
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Zinc, English, London mill	£3 15 0	£3 10 0
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No. 1, Vieux Montagne	25 0 0	25 10 0
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Sheet Lead, 3lb. per sq. ft. super.	12 15 0	13 0 0
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Pig Lead, in test, p.c.	12 0 0	12 5 0
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Lead Shot, in 28lb. bags.	15 0 0	15 3 0
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Copper Sheet, slathing and roofing	0 0 0	0 0 0
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Copper, British Oak and Lincol.	72 5 0	72 15 0
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Tin, Straits	116 0 0	116 5 0
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Do, English Indus	116 0 0	117 0 0
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Spelter, Silesian	16 10 0	16 12 0
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TIMBER.

Teak, Burmah	per load 210 15 0	to £16 15 0
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“ Bangkok	10 10 0	15 10 0
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Qu-ber Tree, yellow	3 17 6	4 15 0
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“ Oak	4 2 6	6 15 0
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“ Birch	4 2 6	6 10 0
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“ Elm	5 10 0	6 5 0
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“ Ash	4 5 0	6 5 0
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Danish and Meloe Oak	2 17 6	4 10 0
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“ Fir	3 10 0	4 7 6
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Waincoat, Lign p. log	3 10 0	4 12 6
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Lath, Danish p.f.	4 10 0	5 10 0
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St. Petersburg	4 10 0	6 10 0
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Greenheart	0 0 0	0 0 0
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Box	7 4 0	15 0 0
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Sepia, U.S.A.	per cube foot	0 1 9
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Mahogany, Cuba, per super foot	0 0 0	0 0 0
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“ Honduras	0 0 0	0 0 0
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“ Mexican	0 0 0	0 0 0
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“ African	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ Honduras	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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“ American	0 0 0	0 0 0
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STONE.*

Darley Dale, in blocks	per foot cube	£20 2 11
Red Mansfield ditto	“	0 2 4
Hard York ditto	“	0 2 10
Ditto ditto, in sawn blocks, loadings	“	0 2 10
Random sizes	per foot sup.	0 2 8
Ditto ditto, in slabs sawn two sides,	“	0 1 3
Hopton-Wood Hard bed in blocks, per foot cube	“	0 2 3
Ditto ditto, in ditto sawn both sides,	“	0 2 3
Loadings, random sizes	per foot sup.	0 2 6
Ditto ditto, in ditto ditto	“	0 1 2
Portland, White Red	per foot cube	0 2 0
Ditto Base Bed	“	0 2 12

* All F.O.R. London.

OILS.

Linseed	per tan	£2 5 0	to £2 10 0
Rapeseed, English pale	“	27 5 0	27 5 0
Do, brown	“	26 5 0	26 5 0
Cottonseed, refined	“	21 0 0	21 5 0
Oil, Spanish	“	38 0 0	40 0 0
Seed, pale	“	31 0 0	31 0 0
Cocunut, Cochin	“	31 0 0	31 0 0
Do, Ceylon	“	26 10 0	26 10 0
Palm, Lagos	“	25 10 0	25 10 0
Oliver	“	17 5 0	18 5 0
Lubricating U.S.	per gal.	0 7 0	0 7 0
Petroleum, refined	“	0 5 0	0 5 0
Tar, Stockholm	per barrel	1 6 0	1 6 0
Do, American	“	1 1 0	1 1 0
Turpentine, American	per tan	37 0 0	37 5 0

W. H. LASCELLES and Co.,

121, Bunhill Row, London, E.C.

TELEPHONE No. 270.

HIGH-CLASS JOINERY.

LASCELLES' CONCRETE,

Conservatories & Greenhouses.

WOODEN BUILDINGS.

BANK, OFFICE, & SHOP FITTINGS.

CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

WM. OLIVER & SONS,

MAHOAGANY, WAINSCOT, WALNUT,

TEAK, VENEER, and PANCYWOOD,

MERCHANTS,

120, BUNHILL ROW, LONDON, E.C.

The most extensive Stock of every kind of

Wood in Planks and Boards, dry and fit

for immediate use.

TENDERS.

* * * Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender; it adds to the value of the information.

AYMOUTH.—For providing a weigh-bridge, for the Bristol Docks Committee—
L. Light, Ltd. accepted.AYMOUTH.—For providing office accommodation, for the Bristol Docks Committee—
L. Light, Ltd. accepted.BIRMINGHAM.—For the erection of new union offices in Conway-street, Haymarket, for the board of guardians—
Forde, W. H., Birkenhead. £18,000 0 0.

CANNOCK STAFFS.—For the erection of new infirmary for 16 patients, for the board of guardians. Mr. Ashton Vead, Wolverhampton, architect.

WALLINGFORD, Hants.—H. and Co., Wallingford—
haughton £5,534 15 0

James, J. L., Wallinghampton £3,134 13 0

Bloxham, J., Bloxham £5,186 0 0

Sprenger, J., Wallinghampton £4,119 0 0

Hopkins, W., Birmingham £4,955 0 0

Williams, A., Great Wyldie £4,121 12 0

Epsley and Sons, St. Albans £4,941 0 0

Roxburgh, J., Cannock £4,861 0 0

Whittingham, E., Newport, Shrops. £4,845 0 0

Roxburgh, J., Cannock £4,845 0 0

Gibbs, W. H., Birmingham £4,975 0 0

Sprenger, J., Wallinghampton £4,119 0 0

Mason, T., Heddon-street accepted £4,955 0 0

Additional cost of wood block doors, £85 10s.

LONDON.—For making-up De Leece-hall, for the urban district council—
Brown, G. W. accepted. £221 2 3LONDON.—For making-up White-hall, for the urban district council—
Brown, G. W. accepted. £1,234 16 7LONDON.—For repair to Cleve Bridge, for the Choptoe Suburban Rural District Council—
Webb, J., Brighton, accepted.

LONDON.—For re-lining the interior of the Clumpion Hill Infirmary, East Dulwich-road, S.E., for the Southwark Urban Guardians. Mr. G. D. Stevenson, architect.

Richard, J. J., Brixton accepted.

FROTHAM.—For the erection of workhouse infirmary, for the board of guardians—
Fincher and Co., Stratford £7,385 0 0

Vale, T., Stourport £9,035 0 0

Howers and Co., Hereford £3,711 0 0

Collins and Godfrey, Tewkesbury £3,721 0 0

Gibbs, W. H., Birmingham £4,119 0 0

Epsley and Co., Evesham accepted. £3,585 0 0

FELHAM, S.W.—For executing painting and cleaning works at the workhouse infirmary and offices, for the board of guardians—
Hulse, J., Fulham £1,615 0 0

Renshaw, W. J., Putney £1,477 0 0

Beudon, T., Hammersmith £1,477 0 0

Vigor and Co., Poplar £63 0 0

Richards, J. J., Brixton £792 0 0

McArthur, G., Fulham (accepted) £4,121 12 0

Mills, E., Westcombe Park £713 0 0

HARRINGTON.—For supplying and fixing constructional and sundry ironwork at New Road, for the corporation of Harrogate. J. Bole, A.R.I.B.A., architect.

Quantities supplied—
Kear, Ltd., Birmingham £1,825 0 0

Wood, E., and Co., Manchester £9,908 0 0

Power, Power, and Co., London £9,908 0 0

Dean, Harns, and Co., London £4,941 0 0

Young, H. T., & Co., Ltd., Plimlico £3,153 3 1

Wright and Son, Hull £4,337 0 0

Hickson and Rother, Manchester £4,941 0 0

Bagshaw and Sons, Batley £4,833 10 0

Baker, W. A., and Co., Newport £4,941 0 0

Richards and Co., Leicester £4,941 0 0

Hodgson and Co., Cleckheaton £4,941 0 0

Atkinson, D., Harrogate £4,887 0 0

Richards and Co., Leicester £4,941 0 0

Pierson and Co., London £4,975 0 0

Schiffel and Hancock, accepted. £7,411 0 0

LITCHFIELD.—For the supply of engine, governors, and scumifier, for the city council—
Aveling and Porter, Rochester £305 0 0

LONDON.—For boring for water to a depth of 2,700 ft., for the city council. Mr. Percy Griffiths, Westminster, engineer.

Chapman, C., & Sons, Ltd., Salford, £14,063 0 0

(Accepted); lowest of seven tenders received.

LITTLETON.—For drainage works, for the burgh council. Messrs. Warren and Stuart, engineers.

Blair & White, Glasgow (accepted) £5,164 18 11

LITTLETON, WILTSHIRE.—For repairing the ford on the river Avon, near the Fish and Anchor Inn, Littleton, for the Froham Rural District Council—
Vale, T., Stourport accepted. £253 0 0LONDON.—For works of painting, &c., at various school buildings, for the City of London School Board—
Wardsworth School—Painting interior and exterior—
Patrick, J. and M. £1,321 0 0

Deering, C., and Son £1,078 0 0

Glover, J., and Son £1,083 0 0

McCormick and Sons £1,095 0 0

Marchant and Hirst £990 0 0

Stevens Bros. £940 0 0

Pearson, M. accepted. £831 0 0

HARLEIGH-road school—Painting interior—
Deering, C., and Son £280 0 0



• DESIGN PLACED SECOND W. J. MORLEY AND SON, ARCHTS.

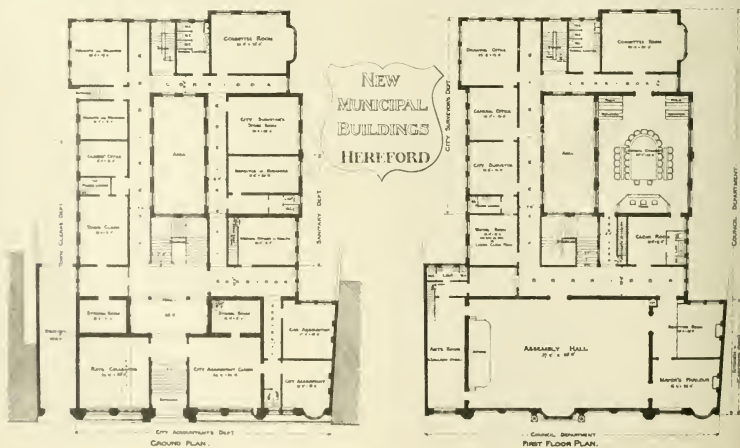






PHOTO: TIMOTHY J. JAMES/AGENCE FRANCE PRESSE

L'ITALIA DANIELI - CHIOD STALLS - SANTA MARIA DELLA GRAZIE AT MILAN.

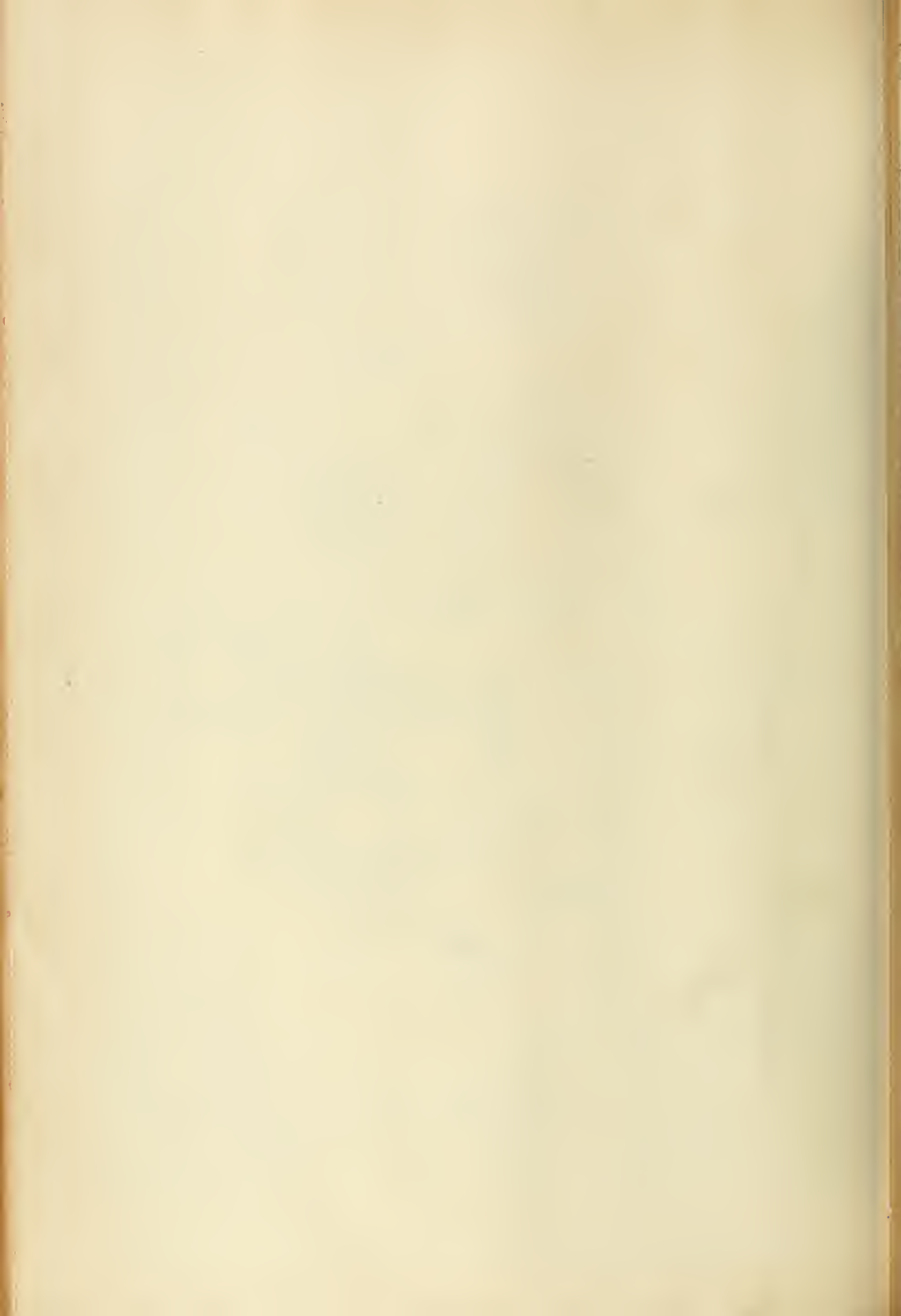


"PHOTO-TINT" BY JAMES ALGERMAN & CO. LONDON

INTARSIA PANELS CHOIR STALLS SANTA MARIA DELLA GRAZIE AT MILAN.



ALTERATION TO RESIDENCE FOR
MRS. M. B. HEWITT, CAMBRIDGE, N.Y.
FR. COMSTOCK, ARCHT.



THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXXXI.—No. 2434.

FRIDAY, AUGUST 30, 1901.

THE REVOLUTION IN BUILDING.

ONE of the most vital questions affecting the great tide of rebuilding that is sweeping over London is the greater height of the erections that are taking the place of the older buildings. Unfortunately, it is in the denser and more crowded parts of the Metropolis that this is the rule. The important letter from Dr. John Henry Bridges in the *Times* the other day comes with considerable weight from his long official connection under the Local Government Board. He therein speaks, in connection with the open-air treatment of disease, of the revolution which for the last 20 years has been taking place in the building operations of London, and which is proceeding now more speedily than ever; and he points out that "the demolition of ordinary dwelling-houses and their replacement by flats make it possible to accommodate twice or thrice the population of any given area." The erection of blocks of "flats" can be seen in every quarter of London. In the West we notice huge "mansions," as they are euphemistically called, at South Kensington, Brompton, in the neighbourhood of Addison-road, Uxbridge-road, Bayswater; in the south and south-west, large residential blocks have been erected in the Borough, Walworth, Camberwell, Brixton, and Battersea, and the same craze is seen in the northern and eastern suburbs wherever old leases have fallen in, and the density of the population calls for larger accommodation per given area. This is, after all, the principal reason for their existence. A district or suburb rapidly increases in population from various causes; the absorption of one estate after another takes place by the speculative builder, old houses come down and are rebuilt; but the fact is everywhere apparent that the new building area must be extended, or the houses must be rebuilt to accommodate twice or three times the number of persons they did before. Unfortunately, the demand satisfies the greed of the landowner or lessee, and the block of flats is the natural outcome. In one word, open spaces are covered, and old houses are rebuilt larger. The "model dwelling," as it is sometimes called, rises where there was before an old-fashioned comfortable brick house of the 18th century type, with good rooms and hall and a garden back and front. The process is repeated till a whole road is rebuilt with dwelling-houses or tenements of a class that is still driving the professional and better classes of residents out of town. But a greater objection follows in the wake of the builder of flats and tenements. The condition is unfavourable to health, for in spite of better drainage and sanitary conveniences, the blocks are crowded together in the most reckless way. Dr. Bridges says: "Although, considering the careless way in which most houses down to a very recent period have been built, it would generally be possible to place larger numbers on the same site without prejudice to health, if due precautions were taken. But so far from such precautions being taken, the new blocks of brickwork, often very handsome externally (?), which are rapidly changing the face of London, are in a large number of cases constructed in absolute defiance of the best-known laws of health, and especially of that which it is amongst the objects of the congress on tubercular diseases to enforce—the dependence of health on the free distribution of fresh air to each inmate." Here we have the opinion of a leading hygienist on our

modern building movement from one—the most vital—point of view. Yet it is one view only. He is oblivious of the change which these buildings make in altering the face of London. Alas! yes; but in what manner. He generously speaks of the often handsome external appearance of the new buildings. Save the mark! Other people are, perhaps, better qualified to speak authoritatively in this respect, as he is on the question of air and light. Without almost an exception the appearance and architecture of London has been spoiled, and few can deny the statement.

But let us confine our attention to the question of health now. The author of the letter we have quoted goes on to explain in what manner the known laws of health are defied. He says: "A very large proportion of flats are built round an inclosed space, varying from 10ft. to 30ft. in diameter, and from 80ft. to 100ft. in height, forming an unventilated and unventilated shaft. Into this the offices, larders, kitchens, and inferior bedrooms look, and from it they derive their principal supply of air. At the level of the topmost story the air may be renewed as the wind passes by; but at lower levels it must remain indefinitely stagnant. The behaviour of bacteria throughout this space I leave to specialists in this branch of science; but surely they will not be dispersed by the natural motion of the atmosphere, nor will they be killed by sunlight." Here is a powerful indictment by a medical inspector of large experience against all our box-ted block dwellings as they are to be seen in many parts of London, as, for example, at Clerkenwell, Bethnal Green, Blackfriars, and many other parts. Many of them as built are little better than disease traps, as the dwellings are built round areas or dingy, ill-ventilated courts, and would not be tolerated for any workhouse infirmary in the kingdom. It is scarcely possible to believe that the promoters and builders of the great housing problem in the chief city of the Empire, who have so carefully studied and considered every detail of sanitation as applied to dwellings, should yet omit to follow the most important and admitted of all laws of health. Yet so it is. While carrying out perfect plans, and observing the strictest rules of sanitation within, they have allowed the blocks of dwellings to be built in any cramped site that could be obtained, and to be built so close together that any reasonable amount of light is not obtainable. The consequence of these narrow courts and spaces between blocks and dwellings is that no sunlight can enter the windows of rooms below the two upper stories at most, and therefore that one great agency in purifying the air of such courts is lost. It would be of interest to examine all the sites of such buildings in London to discover the number of objectionable and polluted courts. A few sections showing the height of the blocks and the width of the courts and spaces between would be of considerable interest in this discussion. The London Building Act (1894) provision of space in the case of new domestic buildings is by no means adequate, and we think the strictures of Dr. Bridges are applicable to other kinds of buildings besides flats, which are constructed in conformity with section 41. Here we have the latest rules bearing on the question framed for the Metropolis, and we find that for domestic buildings abutting on new streets a space of an aggregate extent of 150sq. ft. is considered sufficient, and supposing that the width of building is 20ft., the depth of such space would be only 7½ ft. 6in. (for $150 \div 20 = 7\frac{1}{2}$) if the rule was literally carried out; but according to subsection (2) the open space is to extend the entire width of such building, and have a depth in every part of at least 10ft. from such building, so for a 20ft. width of building the area would have to be 200ft. Subsection iii, referring to height in relation to space in

rear, describes a mode of adjustment based on a diagonal line drawn from a horizontal line at the level of pavement, at an angle of 63°, which diagonal line is to be the bounding line, no part of the building to extend above it, except features like chimneys, &c. But this angle is quite inadequate to allow the rays of the sun, except in the middle of summer, to enter the lower windows of any building in the rear. As an angle of 63° wants only 26½° to the right angle, a very inadequate space for light and air is left in the case of houses backing on to others of greater height. These regulations do not affect flats or lodging-houses, hotels, and similar buildings exceeding 250,000 ft. The residential flat of a superior kind would come under this class of buildings, and their construction is left to the district surveyor or to the Tribunal of Appeal. Section 42 deals with dwelling-houses "to be inhabited, or adapted to be inhabited, by persons of the working classes not abutting upon a street."

It provides that any person about to erect such dwellings shall submit plans a month before; and if the Council are satisfied that the open space for air and light is not sufficient, they may close to erection such places, or prescribe such conditions as they may think desirable, except in certain cases. The Council has a dispensing power, and they can allow any part of any domestic building to extend above the diagonal line 63°, provided they are satisfied that an "open cubic space of air" is given at the rear of such building equivalent to the open cubic space which would have been provided at the rear if such diagonal line had been drawn from the ground line, as provided in subsection 1 (iii). So, as a matter of fact, blocks of flats for the working classes are practically permitted to be built in any circumstances allowed by the Council sanction.

Another writer on the subject, Dr. Edward C. Seaton, Lecturer on Sanitary Administration and Public Health at St. Thomas's Hospital, says truly some dreadful specimens of block-dwellings and flats are to be seen, erected some years previous up to almost the very day that the 1894 Act came into operation. These are to be found not only in the poor districts of east and central London, but in the most fashionable regions of the West-end. "The necessities of the working-classes and the modern tendency to reside in flats (for domestic reasons) together with the desire of ground landlords and builders to make the most of their opportunities, combined to produce the most appalling results." He also points out the minimum standard of light and air which will pass becomes also very frequently the maximum. We have also to consider the greater height of block-dwellings in relation to the space between them, as compared with the height of and space between the old-fashioned dwellings which they are replacing. These are points from which we can compare results.

The subject of the amount and intensity of sunshine is so important in the connection that it ought to be studied by all builders of large blocks of dwellings, and the orientation and altitude of the sun at each season should be borne in mind in deciding upon the aspect of the chief windows. This, of course, is difficult in towns; but some adjustment of the number and area of windows, and of height of building can always be made. If we make a diagram of a plan of a house standing north and south, and indicate by arrows the angles at which the sun enters the windows on each of the four sides on June 21 and Dec. 21, we shall see how many more enter the south-side window than those on the other sides of a house. Thus we shall find the arrows directly enter the windows on the east and west sides in the summer months, and the windows on the north receive rays at 4 a.m. to 8 p.m., but only the south side receives direct sunshine during midwinter. Again, if we look at a diagram showing the

sun's altitude at noon throughout the year, we shall note how very insufficient is the admission of sunshine into our buildings whose height has been regulated by the statutory diagonal line of 63°. Thus it is easily seen that this angle would exclude the direct rays of the sun during the greater part of the year, and it would only during the months of June and July that the sun would illuminate any building on the other side of the space. The sun's altitude at noon on June 21 gives an angle of 62° 1', on March 21 and Sept. 21 the angle is 49° 4', and on Dec. 21 45° 4'. To take a practical illustration, Between 1 and 2 o'clock in August the shadow cast by four-towered houses on the east side of Drury-lane, which faces about south-west, extends across the whole width of street, but if the angle of 63° had been the rule, a considerable part of the opposite houses would have been submerged in the shadow. In the streets running across at right angles N.E. and S.W. of course the rays illuminate both sides of the street, and the houses get a fair share of sunlight during the middle of the day. These facts ought to teach designers of large blocks of flats to place their courts and inter-block spaces in a direction coincident with the rays, so that both sides may receive a share of the mid-day sun. As south windows receive the largest amount of sunlight during winter, blocks of flats ought, if possible, to be planned to obtain this advantage, or as nearly as circumstances permit. Another lesson should be learnt by builders of these blocks—namely, the varying degrees of illumination at different angles of incidence. Thus a number of pencils of light each of 10 falling on a horizontal surface like a pavement or floor will vary in intensity according to the tangents of the angles they make with that surface. The pencils at a distance from the perpendicular will be wider than those near, and the illuminations will be inversely as the squares of their width. For this reason the higher the room the better, as the illuminating power is greater; all rays received at the farther end of the room from window are more dispersed. Indeed, if we draw diagrams showing the light and shade in the several stories of a house from lines drawn from the summit of opposite house, we shall see the amount of light received from the sky varies. In the upper rooms the portion of sky visible is smaller; it is less on the second and first floor, and scarcely visible at all on the ground floor. The rays or pencils of light are restricted to the apertures of each story. The vertical height of each pencil is circumscribed diminishes from the top to the lower story. In short, the illuminating power of the sky is directly influenced by the distance between the buildings. The heads of all windows should be placed as high as can be, so as to obtain as much vertical height of sky area as possible.

If we compare our block buildings or flats with other buildings erected under the control of the Local Government, we at once can ask the question, Why do not similar rules exist? Mr. Bridges, speaking from an experience of more than twenty years as medical inspector of that board, says that "no such building as these described would be for a moment tolerated by that authority if proposed for their sanction by any board of guardians in the kingdom; and in saying this I do not speak only of Poor-law workhouses, but of buildings appropriated to healthy inmates. The same thing may be said of prisons or of public elementary schools. We well know that the ward blocks or pavilions of hospitals and asylums are allowed a wide space between them, and the space at least twice the height of the highest of the blocks. It is also a generally recognised principle in workhouse construction to avoid aggregating large numbers of the inmates in any one block; hence the plan of separation or segregating them as we find

adopted in all the large modern hospitals, asylums, barracks, and prisons. Why is it that the same principle is not followed in the construction of block dwellings in our towns, thus avoiding the spread of infectious diseases and the danger of the spread of fire? No; for some unaccountable reason—probably the influence of the ground landlord—the dwellings for our free working citizens must be crowded together in a worse degree than would be allowed for those under restraint or in the words of our workhouses! Then air and light are elements that are becoming more than ever of vital consequence to our city life; and for this reason they should be guarded from encroachment at all costs.

BUILDING RULES.

AMONGST the many things the architect's position are called upon to understand are building regulations of various kinds, and one of the chief essentials in modern practice is a knowledge of statutory law and those regulations which experience have established relating to buildings for different uses. The age has gone by when the architect could sit down with a free hand and design a building independently of all statutes in a style he affected, when municipal regulations and restrictions did not interfere with his structure, his lines of frontage, or the plan of his work. Now, he is confronted with the by-laws and regulations of Building Acts relating to a variety of matters like "prescribed lines of building," foundations, thicknesses of walls, window openings, entrance and exit areas, heights, and he has also to be proficient in a great many other things referring to the plan and arrangement of his design, to meet the requirements of Government departments and other officials. To some extent these rules and restrictions of their width. For this reason the higher the room the better, as the illuminating power is greater; all rays received at the farther end of the room from window are more dispersed. Indeed, if we draw diagrams showing the light and shade in the several stories of a house from lines drawn from the summit of opposite house, we shall see the amount of light received from the sky varies. In the upper rooms the portion of sky visible is smaller; it is less on the second and first floor, and scarcely visible at all on the ground floor. The rays or pencils of light are restricted to the apertures of each story. The vertical height of each pencil is circumscribed diminishes from the top to the lower story. In short, the illuminating power of the sky is directly influenced by the distance between the buildings. The heads of all windows should be placed as high as can be, so as to obtain as much vertical height of sky area as possible.

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quite ignored, and in some board schools a fourth standard of 70 scholars is provided for in a classroom for 60. Other irregularities are met with as to desks and fittings.

A very important series of rules has been just issued by the Board of Education for buildings of higher elementary schools, a summary of which we published last week (p. 234), and to it we refer the reader. These rules will have to be learned by the architect engaged in school-building, and will form the basis of all future schools of this class. Great prominence is given to the classroom; for a school of 300 pupils ten classrooms have to be provided; and another principal feature is laboratory accommodation. Referring to the classroom unit, we find a larger area per scholar stipulated for. It is laid down that every class should have its own classroom, and the Code limits the numbers of higher elementary schools to about 300, for which, therefore, not more than 30 classrooms are allowed. Of the ten classrooms, four should be suitable for a class of 40 scholars, each room having an area of about 620sq. ft., equal to 15sq. ft. for each scholar. A classroom for 30 scholars should have, it is stated, an area of about 480sq. ft. All the classrooms are to be furnished with single desks; these to be 2 ft. long, arranged in pairs, with intervals of 2 in. and gangways of 2 ft. These rules, it will be seen, give more room than those previously stipulated, and the unit of space for the scholar is enlarged. The architect will have to modify and revise his studies, and it would be useful if he worked out a plan of classrooms for 40 and 30 scholars respectively, showing the single-seat arrangement. The laboratory accommodation is an important item in the higher elementary school requirements. Every such school is to be provided with suitable laboratories; they must be sufficient to provide at one time for the largest class in the school, and it is proposed there should be one laboratory for chemistry and one for physics. A floor-space of 70sq. ft. for each scholar is to be provided, so for, say 30 scholars, an area of 900sq. ft. would be required, or a room, say, 40 ft. by 22 ft.; but the minimum size will be 600sq. ft., or a room to accommodate 20 scholars. If the laboratory accommodates more than 25 scholars, a second teacher is necessary. Then there are rules and data to observe as to the fittings. The tables must be well placed and lighted, and supplied with gas and water. For chemical laboratories, sinks, cupboards, and fume closets must be provided, for which purpose the details of fittings used in the best laboratories should be carefully studied. The work by Mr. E. C. Robins on "Technical School and College Building" illustrates many of the best technical schools and laboratory fittings on the Continent as well as in this country, and will furnish the architect with some good models and arrangements of fittings, as these are drawn to a good scale. A lecture-room-room of an area of about 1,000sq. ft., with small preparation-rooms fitted with bench, sink, cupboard, &c., is necessary, and a classroom for advanced drawing, affording a floor-space of about 30sq. ft. per scholar is also named; the hall, if well lighted, might answer for this purpose. Rooms for cookery, laundry work, manual instruction, have to be provided according to Schedule VII. of the Code.

These are the leading rules for buildings of higher elementary schools to which we best planned, as in many of the Board schools, with a central hall; the classrooms could be arranged on two sides. The dimensions suggested for the central hall are 50 ft. by 25 ft., and it could be adopted for use as a gymnasium, if required; for this purpose, a floor space of 1800sq. ft. is necessary, and it is also pointed out that the laboratories for obvious reasons should not be adjacent to



such a gymnasium. We have referred in some detail to these new regulations, as they are very apt to be overlooked. Schools of this kind will be largely required in the future, and the profession will be invited to enter into competition for new buildings. With the most thorough knowledge of what has been done in school construction, it is easy to overlook the rules which have been made, upon which particular stress is often laid by assessors.

In other directions besides schools, the professional man has need to be well posted if he desires to keep pace with modern requirements. Take, for example, Poor Law buildings. What important developments have been made, as pointed out by Mr. Percival Gordon Smith, in his new work "Suggestions as to the Planning of Poor Law Buildings," which we recommend to the notice of all interested in this branch of the profession. An improved classification of the inmates of workhouses is leading to many important changes in the arrangements of such buildings. We can only refer here to the removal of children from workhouses, that has taken place for some time, and the alterations that are likely to take place in consequence; to the separate treatment of classes of inmates like epileptics and imbeciles, which will before long have to be dealt with by the Legislature. County councils and also local guardians of the poor will have the problem before them. The removal of these classes of inmates will entail important alterations in the design of the buildings. A great deal has been experimental. Before the Poor-laws came into operation classification was not attempted, or was of the simplest character:

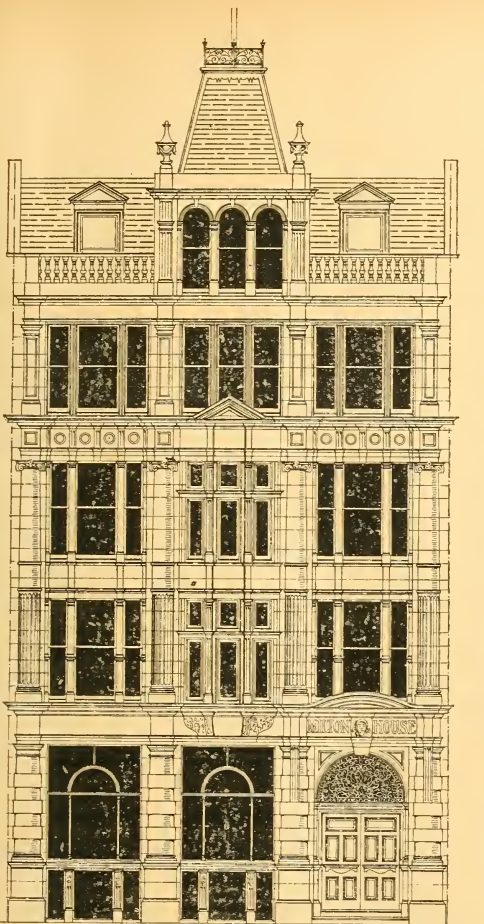
the workhouse was self-contained; but since that time the plans of buildings have had to preserve a classification of each sex, the aged and infirm, the able-bodied, harmless lunatics, the sick, married couples, infants, probationers. The sexes must be completely separated. This classification implies a separation of day-rooms, dormitories, entrances, staircases, yards, lavatories, &c. There must also be distinct buildings for vagrants, the sick and isolation wards. Several rules are laid down, such as the subdivision of the buildings into blocks; that they must not be connected at an angle; that the blocks should be spaced so as to allow free access of light and air; that the rooms should not exceed a certain length; the position of the beds, &c., dimensions and plans, and materials of every part are prescribed by the authorities. It is not possible that such a variety of miscellaneous information can be mastered by the general practitioner engaged in other kinds of professional work. Therefore it is reasonable that a few take up this and other special branches and make themselves adepts in the requirements. Yet the ordinary practitioner is expected to know where he can obtain the actual requirements of such buildings: the authorised and official rules should, therefore, be within his reach. If he has not got them at his finger's end, he should have the elements of the plan in his mind; he should understand the system adopted, so that whether it is a hospital or an asylum, a barracks or a prison, a technical or an art school, he ought to be able to avoid any serious mistake, and to place his hands on certain authorised regulations or rules. The chief faculty is not that of literal knowledge, of being able to remember every dimension

and figure, but of understanding the principle and spirit of the law or rule.

It may be questioned, however, whether such knowledge of the statute law of building, of the rules and regulations of authorities and departments, has not rather a restrictive and hampering influence on the architect; whether, in fact, he could not produce in many cases abler designs if left quite free. We are not quite satisfied that he could in the special class of buildings we refer to. The very temptation to try an experiment would be fatal. Nor do we think the restricting influence of law and conditions can produce such a deterrent effect as imagined on those men who have once mastered the principles of the law, and who, after digesting them thoroughly, can throw them aside, trusting to their own intrinsic sense of what is essential in them, and so imbued give them the free expression of their artistic mind; but the conditions must be thoroughly learned and made one's own. For those who have neglected to furnish their minds with the facts and data given in such documents, and who at the last moment when they have a competition design to prepare begin to consult them, the effort is vain, for they begin for the first time to master facts which it has taken years to collect and formulate; their plans shaped on previous conceptions are crude and necessarily defective.

WROTHAM CHURCH, KENT.

THIS drawing of the well-known Church at Wrotham, Kent, was submitted, with others, by Mr. C. B. Pearson, for the Pugin Studentship Competition at the R.I.B.A. this year.



NOS. XVIII. AND XIX., CHISWELL-STREET, E.C.—DELISSA JOSEPH, Architect.

other buildings in towns. In addition to this I caused an examination to be made of about a hundred old stone buildings in various parts of London. It was found that nearly all these buildings also showed signs of decay as serious as that at Lambeth or Westminster. From this it would appear that the decay of the stonework of Westminster Abbey and Lambeth Palace is not more serious and rapid than that of other stone buildings in London. Moreover, before the Lambeth potteries were established, attention had been directed to the bad condition of the stone on the outside of Westminster Abbey, and Sir Christopher Wren stated that the stone is decayed 4in. deep, and falls off perpetually in great scales.

Having regard to these facts, it is reasonable to infer that the decay of these buildings cannot be specially attributed to fumes from the potteries, but is due partly to the great age of the buildings, the natural decay of which has no doubt been accelerated by the generally smoky atmosphere of London, and partly to the fact that much of the stone used is not well suited to resist such an atmosphere.

NOS. XVIII. AND XIX., CHISWELL STREET.

THIS is an elevation of new business premises in Chiswell-street, City, of which Mr. Delissa Joseph is the architect.

HEXHAM'S ANCIENT PANTS.

A CORRESPONDENT writes:—The erection of a new drinking fountain in the Market-place, Hexham, recalls the fact that the Hexham people are returning to the customs of their forefathers in matters of water supply. The old town had its four wells, or pants, as well as its four crosses. The latter were the boundaries for the privilege of sanctuary, and the former for the supply of water. I remember distinctly each of these ancient pants. The Market-place pant was an imposing ornament to the town. The top of the octagonal pillar was ornamented with a small globe, and the water issued from the column through the mouths of two grotesque visages, and flowed into a large stone trough. Above the carved heads was a plate of copper, with the inscription:—

Ex dono
Roberti Allgood
Armigeri
Anno Dni
1703.

This was removed about the year 1867, when the new water company was established. The other three pants had each their distinctive properties or virtues. The Seal pant was much prized as good tea water, and the lovers of that beverage used no other liquid. From the Penny Well, or pant, up Bone-street—or, as it is now called, Skinner's Burn—came splendid drinking water, which was in demand by the well-to-do families and the hotels for its good properties in making excellent toddy. The fourth pant was in Gillesgate, close to Hexham House. It was believed to be the original well that supplied the monks of the monastery close by, and it was customary in the early part of last century to have a supply of water from Gillesgate pant whenever there was a birth expected in a family, so that the infant's first bath might be in water from the monks' well. Unfortunately, the old pant has been removed. The Penny Well pant has also been abandoned; but the Seal well has been reopened after being closed for well nigh 40 years. Therefore, two of the ancient pants are being revived in the "Heart of all England."

JOTTINGS FROM AN ARCHITECT'S NOTEBOOK.

WHEN the general mass of the walling of a building is to be of stone the material has, as an economical necessity, to be procured from the best neighbouring quarry, and there is consequently little room for selection; but for the stone dressings or decorative features where local material is not suitable, the choice of the most durable stone is a matter of the first importance, and not unattended with difficulty. Time is the test of the goodness of materials generally, and consequently an examination of the stone in such old buildings as have successfully withstood its effect should be made, and the material selected

Spencer says very truly that London is in a far worse position than many provincial towns, and he points out that, apart from the injury a smoky atmosphere causes to health and comfort, the damage to stone buildings in London is considerable. Few building stones will stand the London smoke for any great length of time, and the ordinary limestones which are mostly used for building purposes are found to decay very rapidly.

"Complaint has been made from time to time," continues Mr. Spencer, "of the decay of Lambeth Palace and Westminster Abbey, the decay being largely attributed to the fumes of hydrochloric acid emitted in the salt-glazing process at the Lambeth potteries. Acting on the instruction of the Committee I investigated the subject, and found that considerable care is taken to minimise the emission of the acid fumes and smoke from the potteries, and that experiments are continually being made to effect further improvements in this direction. I also found that the number of salt-

glazing kilns, which alone emit acid fumes, has been considerably reduced in recent years, and that a still greater reduction has been made in the quantity of salt and coal used in the kilns. The proprietors of the potteries contend that the emissions of acid fumes are now so slight as to be quite powerless to cause injury either to stone or plants, and they point to the flourishing condition of the trees and shrubs on the Albert Embankment and in Lambeth Palace Gardens as affording conclusive proof of the correctness of their statements.

"There is no doubt that in some portions of Lambeth Palace and Westminster Abbey the decay is very serious. In order to ascertain whether this could be attributed to hydrochloric acid fumes, I had analyses made of portions of the decayed stone. The result showed that only a very small percentage of hydrochloric acid or its compounds was present; certainly not more than the normal percentage found in similar stone in

Geologists, Chemists and geologists for building stones, about the weathering properties of building stones, but it is only a function of the stone of which to enquire into them, that opinions on the subject should not for the architect carry much more weight than that of the "man in the street." As a matter of fact, there is absolutely no way of arriving at a true estimate on the value of the stone, and the quality of the material, but by an examination of the stone which has been exposed to the weather for a long time—say a century or more. The work of Kent and Norfolk, the Colchester Portland and the Carboniferous Limestones of Devonshire and Cornwall, and the Portland of Dorset, have widely different weathering properties, and when submitted to the chemist they are found to be substantially the same substance, viz., calcium carbonate, but this exists in a different chemical condition in each. The geologist finds that most of these stones are of the same origin, and in the study which goes to make up what is known as the earth's crust, he traces the origin of the mineral which composes them, and he knows from the fossil remains imbedded in them, the exact nature of the animal and vegetable life which prevailed on the earth when they were deposited as mud on the bottom of the sea. But the information furnished by these scientists helps in no way to determine which of the stones selected to will make the best weather stone when used as ashlar facing, or as a projecting member in a cornice, or as a continuation of the freestone where used externally in the walling at Westminster Abbey will show that the surface of the stone has been acted on by the weather, and the stone itself wasted away to a depth of 2 in. or more below that surface. Geologists account for this by saying that frost, acting on the rainwater with which the stone is saturated, expands it, and does this increase of bulk in the pores of the stone forces it later to pieces with irresistible force. This is no doubt true under certain conditions; but it does not hold good always, for many porous stones are "waterlogged," do not burst under the influence of long-continued severe frost. At the Church of St. Clement Danes, in the Strand, freestone has been used in the window jambs, and with Portland stone in lining the tower staircase. Here the stone has not been subjected to rain or frost; yet the staircase walling, and the window jambs show the fresh as when the stones left the banker. It is clear, therefore, that some other reason must be found for the decay of stone under certain circumstances than disintegration by frost. When, after the Great Fire of London, Sir Christopher Wren was intrusted with the rebuilding of St. Paul's and over fifty London churches, he had no chemists or geologists to assist him in obtaining a good building stone. Yet he was as lucky in selecting one as the commissioners appointed at great expense, and with the assistance of leading Chemists and geologists, were in obtaining a suitable stone for the new Houses of Parliament. When he had only to obtain a reliable weather-stone, but being a Classic architect, the size of the blocks obtainable was with him a matter of paramount importance. He took an ancient Egyptian stone freestone, and he used it extensively for walling and dressings in the ecclesiastical buildings of the City and Westminster, and perhaps Kentish rag for hearing and rough walling, but an examination of the former at Westminster Abbey would show that the weathering of the stone was very different from the weathering of the Norman and later Medieval walling, and the reasons used for piers, arches, window and door jambs, and other dressed work, stones of much smaller size than could be used in his proposal. He therefore selected Portland stone, so to say, being the best of the two reasons; it furnished a reliable weather-stone, and, being massive, blocks of almost any size he might require for his columns and arches could be easily obtained in it. Apparently he could not have made a better selection, for, with our advanced knowledge of chemistry and geology, it would be difficult to find any other stone which would have fulfilled Wren's requirements more fully than that which he selected. This is evident from an examination of Wren's churches, and from the fact that Portland stone is still used in the City, where durability is the chief consideration. When any doubt is entertained about the weathering properties of stone, it should be examined if possible worked into tostones in some churchyard, in the facings of retaining walls, in rail-

way, rail, or canal bridges, or in cornices, window sills, and other projecting dressed work, and the weathering properties of the stone are sure to be set with its quarry bed vertical; if the stone is unsuitable for building, frost will develop the property known as "fissility," that is, the stone will split in plates parallel to the quarry bed of the stone; or if this property is not developed, the condition of the limestone or sandstone will afford an unerring guide to its weathering qualities. In retaining walls to clay banks or bridges, where water is continuously soaking through the stone from the back and evaporating from the face, a most trying position—a bad condition of the condition of the limestone and other projecting members will probably be found in a more or less disintegrated condition on the under sides where the rain-drops hang and evaporate. The hand if passed along here, with moderate pressure will remove the surface of the stone. It is most important to note how the surface finishing of a stone affects the durability of any worked face—a clean hammer fracture, a pitched face, or a sharp chisel cut, is hardened compared with the blows of a blunt tool delivered at regular intervals, and when they were delivered on a smooth surface appears to be as injurious as tooling it. Speaking generally, it may be said that sandstones require more careful treatment in this respect than the harder limestones; for instance, "tooling" a block of Carboniferous limestone, or Portland (brown oolite, does not appear to affect its weathering properties in any way; whilst the same process applied to any ordinary sandstone would be ruinous. The presence of sand in any quantity in a limestone appears to produce the property known as "fissility," that is, it induces a tendency to split any block into plates under stress of weather when that block is loaded. The plates are frequently of uniform thickness throughout the block and in themselves, and they come away parallel to the quarry bed of the stone. This property, which is exhibited by most micaceous and Coal Measure sandstones, as well as some oolitic limestones, is taken advantage of to obtain the roof-coverings known as "stone tiles" or "stone slates." In sandstone quarries these tiles are raised directly from the quarry beds; but many of the sandy oolites, such as those of the Cotswold Hills, Stonefield, and Collyweston, require to be quarried and prolonged in the quarry for a time when saturated with quarry moisture. The stonemason prepares all stone which requires to be neatly worked and accurately dressed, and sets it in the building. His work is therefore distinct from that of the waller, who hammers, dresses, and sets the rough walling only. The stonemason usually prepares rough work, and other wall facing which requires more dressing than can be given with a waller's "scabbling" hammer. In an important building the majority of the masons are banker hands—that is, they work exclusively at the banker, dressing stones to templates furnished them by the foreman. Some few in proportion are "setters"; they work chiefly on the scaffolds, setting in the building the stones already worked by the banker hands. As each banker mason has his own peculiar mark, which he invariably cuts on the bed of every stone which he dresses, it is not difficult to tell which mason turned out any particular stone passing through his hands. Masons now seldom work stone on any building; the modern method of doing this work is to submit it to some quarryman who furnishes the stone ready worked for building. This man is now employed in the stonework of the building, and the foreman stone-setters. The building has its advantages and disadvantages. An architect who takes any interest in mason work, and who understands anything about stone and working it, will probably prefer to have all his stone worked on the premises of the quarry, and to have the setting of the stonework in a very rough and unfinished state, trusting to the stone-setter to work off the defects; but such a system should not be tolerated, more particularly if hard stone is used, for working a stone after it is set loses the stone its elasticity, and renders it brittle. Some of the mortar or cement joints, varying is, however, an exception to this rule, for it is always done *in situ* after the stone is fixed. Some important buildings are frequently disfigured, years after they are finished, by the appearance of unsightly cracks and streaks in the walling of the dressed stonework. This is caused by stopping defects with shellac and naphtha mixed with powdered stone dust. This stopping was

not observed when the stone was set, but the natural weathering properties of the natural material, especially in the case of the latter, are too painfully evident after a few years' exposure. In setting stonework, the advantages of thick joints (beds) are obvious, for by keeping these raised out to a depth of about an inch back from the face of the wall until the whole work has settled, the dressing stone will in the transverse or space between the lintel and arch, until the building is covered in, the object being to take all pressure off the lintel, which will leave work enough to do to carry its own weight, without that of the superincumbent walling. When a door or window-sill is built into a side wall, and as the walling is carried up, care should be taken to leave the centre length of the sill between the jambs completely free on the under side, as it will most certainly be broken through the middle by the unequal settlement of the piers and window backs. A further precaution to take in the case of the contraction of lime mortar in beds and joints from pressure, and in "setting," where such beds are more numerous in one part of the walling than in others. For instance, in a brick wall where the beds are only 3 in. apart, vertical displacement, though but slight, will be three times greater than that of the facing, owing to the greater quantity of mortar used in it. Many piers in Norman and later churches have failed owing to this shrinkage. The cut stone facing, having few joints comparatively, shrinks little, and the weight which should be distributed over the entire surface is thrown on the casing of the pier only. The bearing, having sunk away from its original level, the under pressure on the ashlar facing bursts it away from the core of the pier: the stones of the facing are, under such circumstances, fractured from top to bottom. The use of Portland-cement mortar will essentially prevent the failure of the pier by attacking its ultimate density in a few hours. But this material should not be allowed to get near the surface of the stonework, as it invariably produces ugly brown stains along the beds and joints, which stains are indelible; and with some stones, such as the Portland oolite, it is not judicious to their weathering properties, judging by the failure of the material in contact with the cement. Oolitic limestones are usually set in a putty made of lime and dust of the particular stone in use. The beds and joints of each stone should be well washed with water, and the water before the putty is applied, the ideal condition of the stone being that it shall not take up water from the putty or add any to it, for in the former case the putty would crumble to powder, and in the latter it would be completely squeezed from between the stones, and thus allow no bed for setting, as one stone would then rest directly on the other, with a dry joint between them. Iron in presence of moist air "rusts." This means that metallic iron combines with the oxygen of the atmosphere to form iron oxide, and in doing so it increases in bulk, and the iron oxide, which is a soft material, is so that iron ties or bars are tightly fixed by leading, cementing, or otherwise, and which ties are within reach of atmospheric influences, must inevitably be destroyed in course of time by the oxidation of the iron. It should be borne in mind that the iron will rust at a rate of about several inches from the face of any wall, and that a considerable amount of moisture is always present in the atmosphere, even on the driest day. In Gothic window tracery, and in jambs and mullions, iron saddle-bars and stanchions have invariably caused about destruction of the stonework from this cause. In unrestored churches it is no uncommon thing to see both tracery and mullions split vertically into two separate pieces along the line of the glass rebate from oxidation of the ironwork inserted there. The foregoing general statement as to the danger of using iron ties does not hold good for ironwork bedded in stone out of the reach of moisture, for iron bars have been removed from the heart of stone walling where they were fixed for over 400 years, and the surfaces were as fresh as when they were first set. All ironwork, such as saddle-bars, stanchions, and other metalwork exposed to atmospheric influences should be of gunmetal, copper, or zinc. Sawn slate may sometimes be used instead of metal. The almost

universal neglect of some precaution in the use of wrought iron with stonework is unaccountable, when so many examples of its disastrous effects may be seen in the case of London or any other large town, where iron railings are led into the keying or plinths to steps and areas. A curious result of leading wrought-iron area railings into stone plinths appears to be that the iron is abnormally eaten away where in actual contact with the lead. Mere oxidation of the ironwork cannot be the cause of the defect, for it occurs even when the lead and iron touch. There is, therefore, some reason for supposing that obscure galvanic action of some kind is set up between the metals in presence of moisture, which is destructive to both.

BATTLE ABBEY, SUSSEX.

[WITH ILLUSTRATIONS.]

THIS abbey was erected by William the Conqueror, to memorialise the spot where the victory of Hastings had been gained. The abbey was dedicated in honour of St. Martin and its ecclesiastical monastic life was maintained by privileges and immunities were conferred upon it, and William endowed the abbey abundantly with various manors and churches in several counties. Here also was deposited the far-famed Roll of Battle Abbey, which was supposed to contain a complete list of all who came to England with the conqueror. The original of this roll is believed to have been lost at the Suppression. The erection of the abbey commenced in 1067, and in 1076 the establishment was sufficiently advanced to permit the appointment of an abbot (Gausbertus), and the partial settlement of the brethren; but at William the Conqueror's death, in 1087, the abbey was still unfinished. The abbey was consecrated until 1095, when William Rufus, accompanied by Archbishop Anselm and other prelates, visited it for that purpose.

From its foundation to suppression, a period of 171 years, Battle Abbey was governed by 32 abbots, and at the Dissolution, according to the records of the abbey, which are now in the Gros, the site was disposed of to a canon named Gilmer, who destroyed great part of the building, and sold the estate to Sir Anthony Browne. What remained of the abbey was subsequently converted into a mansion, which was completed by Anthony Browne Montague, and the entire estate became afterwards the property of the Wotton family, from whom it passed into the hands of the late Lord Harry Vane, afterwards fourth, and last, Duke of Cleveland, and was until her recent decease the residence of his relict, Her Grace the Duchess of Cleveland.

To those who, judging from the ancient magnificence of Battle Abbey, may expect to find great and important remains, will be comparatively disappointed, for parts have been so entirely destroyed, and the features of the remainder have been so much altered, that now Battle Abbey can hardly be realised as an establishment which once possessed such great power and privileges.

The Gateway, through which lies the entrance from the town, terminates the high precinct wall, whose buttresses skirt the road from the station. It stands on a slight elevation looking down the most principal street of Battle, and is perhaps the most perfect portion of the whole. This gateway is considered one of the finest in the country, and is composed of a central tower of the Late Decorated period, supposed to have been inserted in a far earlier building, and in design somewhat resembles the beautiful example of St. Augustine's Monastery at Canterbury, and is supposed to have been built by Albert Rolycey in the early part of Edward the Third's reign. The designs of the north and south fronts are precisely similar; there are two archways, the larger for vehicles, and the smaller for foot-passengers. Both arches are segmental pointed, with labels terminated in scutellated heads; and the arch and lunette mouldings are bold and good in design. The gateway has quadrifurcate gables. Above the gateway is a continuous arcade, pierced in centre with window-openings, which is continued round the octagonal angle turrets. Above is another window of the same beautiful tracery between two canopied niches, out of which the original figures have long since disappeared. Above this are pinnell buttresses; those to the turrets are plain, and have been partly restored. Eastward of the gate-house is a building formerly used as a sessions house, and continued in use till the roof and floor, probably

long neglected, fell during a great storm in 1764. This wing is believed to have been rebuilt by Lord Montague in 1566. From the marks left on the east side of the central portion, the roof must have replaced a former one of higher pitch. This building remains a merely empty shell; the interior is gutted, and the two ranges of Elizabethan windows are left blank and cycless, or in some cases filled with masonry or boarded up. The east and western wing are in a similar condition; but a kitchen has recently been added, and can be reached by means of the south-west turret staircase. In the west wing two windows of the same Decorated period as the central tower were probably inserted when the latter was added, for this building must be at least 150 years older, as in the west wall an unmistakable Norman window with round arch now filled up, supported by two pillars of considerable size and workmanship, with cushion capitals, remain on the outside.

On entering through the gateway, the inhabited portion of the abbey is on the east side of the main gateway, the west side of which is now ruined still remain, the fourth side having been removed during the residence of the Montague family. The hall still remains, and adjoining it is a vaulted apartment, which probably was the strangers' hall of the monastery. Some traces of the original domestic buildings still exist, including that of what was the refectory, an oratory, attached to the abbot's apartments; and further eastward are the remains of the cloisters, consisting of nine Early English arches, filled in with Perpendicular tracery. On the north side of the cloisters, now a flower garden, stood a church, the foundations of the apsidal termination of which were discovered in the year 1871. This is traditionally said to be the spot where Harold fell. The ruins of the refectory stand southward of the church; it was a noble and spacious apartment 106ft. by 35ft., of the Early English period, with lancet windows and massive buttresses. Under the refectory is an exceedingly beautiful painted crypt, which is supposed to have been the library. On the south side of the principal quadrangle stood the banqueting hall, which as it existed in its perfect state about 150 years, is shown on an old engraving, but at present a raised terrace, with two turrets at the western extremity, is all that remains of this portion of the abbey.

VICTOR E. BOSNELL.

ARMOUR'D CONCRETE IN FORTIFICATIONS.

FROM time to time as occasions arise we have kept our readers thoroughly *au courant* and well versed in all the progress of the new armour'd concrete construction in the numerous phases to which it has been applied. Except in the cases of fireproof flooring and arches of insignificant span for culverts, sewers, and small subterranean footways, this system of building has for reasons more than once pointed out in our columns, made but comparatively very little headway in England. It has not come into general favour with either our architects or engineers, and consequently not into general use with the practical builder and contractor. It is to Germany and other parts of the Continent that we must look for the large bridges of spans of upwards of 150ft. which we have recently been enabled to see in parallel. Varied as are the applications of armour'd concrete, and the success which has attended them, there are nevertheless a few examples of building work for which it is not suitable. As it is manifestly equally, if not more, important to know what a constructive material, or a combination of such materials, is not fit for as well as what it is suitable for, a faithful chronicler should impartially view both sides of the question, and record disadvantages and defects as well as merits and qualities of a valuable character.

The example which we have selected as the subject of our present article is of a national importance so paramount as to require no further introduction. Up to the present time the excellent qualities of simple—that is, of unarmoured—cement concrete have advanced it, for certain works and structures, to the first place in the ranks of constructive materials. It has been employed upon a very considerable scale by nearly every European Power in the strengthening and extending of existing fortifications, as well as in the erection of new ones. There is, therefore, under these circumstances, nothing

surprising that it should be asked whether the employment of armour'd cement concrete would not be attended with a corresponding amount of success under similar conditions. It is contended by the partisans of this system of construction that its principal advantages are the lightness and economy which result from its use, particularly in the reduction of the sizes of the iron steel members required to resist stresses of a tensile nature. The compressive stresses are amply provided for by the tensile disposition of the concrete mass. It should be borne in mind that in all other structures, except fortifications, the forces to which the different parts and separate materials of the concrete, whether armour'd or unarmoured, are exposed, are either of a static description, or of a dynamical character of too mild a quality to seriously affect the stability of the work. On the other hand, in the case of fortifications, external forces are at work of a most violent, impactive, and disruptive nature, as will be further referred to.

It is evident that the introduction of the iron or steel element into the cement concrete can have only one useful result. That is to increase the resistance of the concrete to tensile stresses. Against this statement must be set the fact that the compressive resistance to disintegration and crushing is much diminished by the presence of the metallic materials. They undoubtedly tend, under the effects of explosions and shocks, to weaken and partially destroy that intimate and indispensable intermixture of concrete and sand, gravel, cement, and sand upon which depends the strength of the whole work. When not exposed to the action of artillery and heavy gun-fire, the combined cement and metal affords a very substantial resistance to static forces. Hence its great employment in foundations, floors, reservoirs of large dimensions, arches, and similar structures. These descriptions of structures which have to withstand the action of only certain well-defined forces of a fairly uniform character.

But in dealing with fortifications, it must be remembered that the concrete mass is subjected to a number of violently external forces resulting from the repeated blows and shocks of heavy projectiles. It is not easy to perceive, under these conditions, where the peculiar qualities of armour'd cement concrete, which are admitted, find their proper application. In simple cement concrete the absence of all joints converts a fort into almost a solid mass, and the concrete is perfectly homogeneous. There is no difficulty in the arrangement of the different openings in the walls for such purposes as casemates, embrasures, and entrances to depots for stores, ammunition, and other commodities, inseparable from the general armament of fortified towns. An artificial rock of such a nature, free from all cracks, fissures, and seams, has an advantage over the hardest natural stones and conglomerates. It is not liable to split in pieces in all directions under the destructive effect of explosive projectiles. On the contrary, it restricts their efforts at demolition to a very small area, and very frequently the only sign of conclusion is the indent caused by the violent nature and shock of the blow.

Experiments conducted upon a long range of some twenty forts upon the river Meuse, in Belgium, conclusively demonstrated the proof of our last statement in the following manner. Thirty hard round shot, of various sizes, upon a surface of concrete fairly circular, with a mean diameter of 6ft. The impression made upon any part of this area did not exceed 1in., and there was not the slightest crack or fissure produced, or any molecular displacement in the part of the wall so bombarded, the material easily matter to arrive at the solution of the problem. It is a simple question of cleavage. All natural rocks, except those which are absolutely amorphous, and they are few and rare, are possessed of certain planes of cleavage. Simple cement or ordinary lime concrete has no planes of cleavage. Manifestly, therefore, the introduction into the unarmoured mass of bars, rods, rolled joists, or metallic trellis-work would tend to establish separation of the other materials. In fact, planes of cleavage not previously existing would be developed which would be tantamount to a destruction of the original existing agent. There can be no doubt that the presence of the metallic materials brings about the disintegration of the otherwise sound defensive wall, which by itself has been shown to be sufficiently hard and durable to repel the attacks of artillery.

This serious defect in the armour'd cement

concrete system in its application to the construction of fortifications would be productive of serious results when breaches were made in the walls. They would be difficult, and take a long time to repair. The replacement of the armoured members would be both troublesome and dangerous to accomplish, whereas damaged unarmoured concrete is made good with ease and facility. Some experiments have been carried out upon small armoured concrete blocks, and the conclusions arrived at from the behaviour of these insignificant specimens are so totally unreliable that we refrain from producing them. They have the defect common to all similar experiments made upon small test pieces, that the results constitute no satisfactory indication of the manner in which the material will itself, or the qualities it would exhibit under the dissimilar conditions which would attend its trial upon a working scale of magnitude. Some further experiments are required upon armoured concrete before they are able to resist its attack can be established with any degree of certainty.

T. C.

THE PLANNING OF POOR-LAW BUILDINGS.*

THE volume which Mr. Percival Gordon Smith, F.R.I.B.A., late Architect to the Local Government Board, has brought out is a timely addition to the literature of Poor-law institutions. The author's long official connection with the buildings of the department has prompted him in writing this work on the arrangements that are necessary in their design and construction. The author refers to his early days in the office of one of the first architects of the day, to his being a competitor for some of the earlier Poor-law buildings, and his subsequent engagement in the Architect's Department of the Poor Law Board, then under Mr. Christopher Wren Swages, who joined in 1878. Mr. Percival Gordon Smith visited all the large institutions of the kind in this country, he has been officially consulted by boards of guardians and other authorities, and therefore his experience has well qualified him for the task he has undertaken. The work will be found of much value to guardians who are undertaking new plans for building for the accommodation of the poor in their unions; also to architects engaged in this class of work. Reference is made to the removal of children from workhouses; also to proposed arrangements for epileptics and imbeciles removed from workhouses to other institutions, which changes, when they have been decided by the Legislature, will require considerable alterations in workhouses, and lead to the erection of new buildings for these special classes of inmates. Mr. Gordon Smith has taken much pains to elucidate the principles adopted in Germany for the reception of Poor-law children. The education of workhouse children in the public elementary schools with other children, wherever it has been adopted, has been attended with satisfactory results, leading to the process of depauperizing the population. But their home has still been the workhouse, with all its depressing and undesirable influences. There is now a growing desire to dislocate the children from these surroundings and adult paupers; indeed, of recent years, the provision for children in workhouses has been improved, and accommodation found for them elsewhere. The author gives many useful hints. He refers to the special efforts made to provide for these children, sometimes as in the case of Roman Catholic children, independently of the Local Government Board. The advantages of this plan have had to be met, and huge buildings, often not the most hygienic in construction, have been built, and when completed a certificate of the Board has been applied for. Hence the Local Government Board have had to lay down certain fundamental principles for observance when they have been applied to in advance for conditions as to the subsequent issuing of such certificates. The Board, in an instance, recommended the promoters of a school for 250 boys to build two separate schools on entirely separate sites, each to hold 125 children, and to be erected on the same system, a certificate would not be issued for a large total number than 250 children.

while no single block should hold more than 50 children. And that in each block day-rooms should be provided; also latrine arrangements for the children of that particular block, and a meal-room, other than a common refectory for dinners. Mr. Gordon Smith illustrates a block plan for certified school under these conditions, designed to hold 210 children in four distinct blocks of 60 each, erected at Teesdale, Durham, from the designs of Mr. A. W. Tasker, F.R.I.B.A. This plan forms a quadrangle. In the centre are the administration offices and dining-room, the sides being composed of four blocks each three-stories to hold 60 children each, separated by a staircase block between them. There is a school on the top side of square, and a dormitory block and its own staircase on the other side of square. The other kinds of accommodation for children most favoured by boards of guardians, as well as by the L.G.B., are *a*) scattered homes, *b*) grouped homes; and these all are divided into families of fifteen or less children in each home, for boys of 5 to 10 in each block to hold such groups. Both these plans are described. Homes are hired rather than purposely built for the purpose of scattered homes. Diagrams are given showing block arrangements for grouped cottages homes where the total number of children is some 500; also for a group of single cottage homes, and a pair of cottages homes. Taking a single cottage home in the Bridgend and Cowbridge Union, we find it consists, on the ground floor, of a day-room 18ft. by 13ft., a kitchen 18ft. by 11ft., with stairs, scullery, and office between for boys and girls separately; the upper floor has for boys a bedroom 18ft. by 11ft., and for girls 18ft. by 15ft., separated by a mothers' room between. This cottage can be repeated in a pair of cottages. When the number of children in a cottage is fifteen or less, the space for each bedroom is about six, the space per child may be put at about 30ft. to 36ft. of floor area and 3000 ft. of air-space as a minimum, the height of the bedrooms being from 8ft. 6in. to 9ft.; if the block is for more than fifteen children and the dormitories are to hold ten or twelve, a minimum height of 10ft. is requisite. 36ft. of floor area and 3000 ft. of air-space per child. A "receiving-house" for children is to prevent the "ins" and "outs" from mixing with the more permanent children, also to afford the means of ascertaining the state of health of the newly-arrived children before sending them to the cottage home full of children, and also of finding out the character and disposition of each child. It is a kind of casual or preparatory house. A plan is also shown of one. A list of cottage homes belonging to unions is given, and their cost is considered. The other portion of the volume deals with the workhouse for adults. The stable of workhouses and infirmaries with approximate accommodation, and named architect's designs. The extracts from Memorandum, entitled "Points to be Attended to in the Construction of Workhouse Buildings," will be found of interest to all engaged in the planning of these institutions. Each point, which is numbered in order, has a note affixed explaining in more detail, and these are illustrated by sketch plans of vagrants' ward, cells, and day-room; also diagram plans of general hospital, children's hospital, &c. Point 75 refers to the minimum amount of space per inmate for sleeping wards. For children the sick-wards the wall-space is 6ft., the floor-space 600ft., and the cubic space 960ft.; for adults and offensive cases the same. For children the wall-space is 5ft. if the wards are 20ft. in width, 6ft. if only 18ft. wide. But we have no space to refer in more detail to this useful summary of regulations. The Appendix contains circulars issued by the Board on "Drainage of Workhouse Buildings from Fire." "Bathing of Inmates." The points to be attended to as regards fittings and medical appliances are given, also the letter referring to the cubic space in Metropolitan Poor Law buildings under the Poor Law Amendment Act, 1870, and other memoranda of value. Mr. Percival Gordon Smith's work will be found a valuable text-book on the subject, full of information and data.

A Local Government Board inquiry has been held by C. H. Hepper, at Mexborough, into the application of the Urban District Council for sanction to bore a main at a cost of £2,300 for purposes of sewerage and sewage disposal.

HOW TO ESTIMATE: OR, THE ANALYSIS OF BUILDERS' PRICES.—XXI.

By JOHN T. REA, F.S.I., SURVEYOR, War Dept.

HANDRAILS.

FIXED, level or raking:—

Description.	Deal.	Oak.	Mah.
3in. by 3in. rounded per ft. run	s. d.	s. d.	s. d.
3in. by 3in. moulded	8 0	8 1	8 1
Scrolls for handrails	6 15	6 16	6 16
Joint, including screw and nut	1 1	1 7	1 7
Housing ends of 3in. by 3in. handrail, level	0 4	0 4	0 4
Doitto, ditto, but on rake	0 6	0 6	0 6
Housings in handrail to receive balusters	0 2	0 2	0 2

Ramped handrail is worth 2 times straight.

Circular ditto ditto 2½ "

Wrought ditto ditto 4 "

Labour on mahogany handrails equals 1½ times that on deal.

BALUSTERS.

Description.	Deal.	Oak.	Mah.
1in. turned balusters, banded and fixed, 3ft. long each	0 8	1 0	1 0
1in. ditto ditto ditto	1 0	1 10	1 0
2in. ditto ditto ditto	1 2	1 2	1 2
Turning only balusters, ordinary pattern	0 0	0 0	0 0
Ends of balusters dovetailed	0 0	0 0	0 0
Dovetails in steps for balusters if not otherwise taken	0 1	0 1	—

SEWERS.

Description.	Deal.	Oak.	Mah.
3in. by 3in. wrought and fixed square per ft. run	s. d.	s. d.	s. d.
Above 3in. by 3in. ditto per ft. cube	8 13	9 17	6
Turning only sewers, in addition to price as square	1 3	1 10	2 0
Ditto penstocks	0 6	0 10	1 0

SKIRTINGS.

Description.	Deal.	Oak.	Mah.
3in. by 3in. deal torus moulded skirting	s. d.	s. d.	s. d.
and fixed	0 8	1 0	1 0
1in. by 3in. ditto ditto per ft. run	0 3	—	—
1in. by 3in. ditto ditto	0 3	—	—
1in. by 3in. deal wrought o.s., square skirting, and fixed	0 3	—	—
1in. by 3in. ditto chamfered ditto	0 3	—	—
Wrought and splined ground 3in. by 3in. including plugging to walls, grooving, &c.	0 3	—	—
Mixed angles to skirtings	each	0 4	—
Moulds to radiators and chimney pieces	—	0 3	—
Making skirting is 1 more than the price of straight.	—	—	—
Best to curve ditto ditto	—	—	—
Circular ditto	—	—	—

ROOFING FELT.

Isodorous asphalted roofing felt, including 2in. laps, and fixed with iron clout nails, weighing 3lb. per thousand, placed 3ft. apart per square 8 6

SHELVING.

Description.	Deal.	Oak.	Mah.
Nails and labour in laying	—	—	—
1in. wrought shelving and brackets, fixed per ft. sup.	0 6	—	—
1in. wrought louvre boards, fixed	—	—	—

MOULDINGS.

Description.	Deal.	Oak.	Mah.
3in. by 3in. architrave moulding from manufacturer, S.O. per 100ft. run	3 6	—	—
2 1/2in. by 3in. ditto ditto	3 6	—	—
2 1/2in. by 3in. ditto ditto	3 6	—	—
2in. by 3in. ditto ditto	3 6	—	—
3 1/2in. by 3in. gable moulding, trade pattern	2 6	—	—
2 1/2in. by 3in. ditto ditto	2 6	—	—
1 1/2in. by 3in. ditto ditto	2 6	—	—
3in. by 3in. moulded handrail ditto	1 1	—	—
2in. by 3in. under, special moulding, and fixed	—	—	—
2in. by 3in. to 3in. by 3in. ditto ditto	—	—	—
Over 3in. by 3in. ditto ditto	—	—	—

Description.	Deal.	Oak.	Mah.
Capping, rounded or moulded, not exceeding 3in. by 1in., and fixed level or raking per ft. run	0 1	0 6	0 7
Ditto, ditto, but in fixing	0 6	0 7	0 9
Ditto ditto circular on plan	0 9	1 0	1 2
Mitre to capping	0 0	0 0	0 0

SCABRIERS.

Description.	Deal.	Oak.	Mah.
Boarding of floors, roofs, &c., taken up, clearing out nails, and removed to store per square 3 0	—	—	—
Flooring timbers of ground floor, including joints, plan, clearing out nails, taken up and removed to store	—	—	—
Ditto upper floors	—	—	—
Celling joists taken down, nails cleared out, and ditto	—	—	—
Framed roof with tie-beam, purlins, &c., and ditto	—	—	—
Girders taken down and removed to store, ditto	—	—	—

* Plans and Suggestions as to the Planning of Poor-law Buildings, By J. T. REA, F.S.I., late Architect to the Local Government Board, published by the Local Government Board, 10, Whitehall, London, S.W. 1.

Staircases, including tread and riser, with carriages, strings, and spandrel, taken down and removed to store	per ft. super.	0 1
Shelving and brackets, ditto	"	0 1
Oak saddles to doors, up to 12 in. thick, wrought, chamfered, and flined	"	2 0
Lead angle steel, sunk, ploughed, and ploughed to wall	per ft. run	0 3
Doors, based, under 12 in. diam., and ditto sliding taken up and removed to store	"	0 0
Doors and frames taken down and re- moved to store	each	1 0
Doors only, ditto, ditto	"	0 6
Frames only, ditto, ditto	"	0 10
Frames only, ditto, ditto	"	0 10
Frames only (lower or upper), ditto, ditto	"	0 7
Doors and frames, with hinges, window- boards, architraves, and shutters, &c., taken down and removed to store	"	3 6
W. fittings, deal, including steel, riser, slap, beams, &c., ditto	per seat	2 6
Ditto, mahogany, ditto	"	3 6
Large timber cases, pinned and wedged in wall	each end	1 0
Slat fir poles, 30 ft. long	each	4 0
Holes cut from 3 in. to 6 in. diam. or cut out at each in depth	"	0 6
Cut feet to rafters	"	0 3
Moulded ditto	"	0 6
Wired door saddles, 5 in. by 5 in., by 3 ft. long, and fixed	"	1 3

Labour only in deal. For oak, mahogany,
pitch-pine, and other hard woods, about double
the following prices:—

Arms or small-chamber under 12 in. wide, straight	s. d.	0 10
Ditto ditto ditto circular	per 100 ft. run	0 2
Edges shot or wrought, under 3 in. thick, straight	"	0 2
Ditto ditto ditto circular	"	0 2
Beading as for floor boards	"	0 3
Single beading, straight	per ft. run	0 0
Ditto ditto circular	"	0 0
Beading or staff beading, straight	"	0 0
Ditto ditto circular	"	0 0
Chamfering, not exceeding 2 in. wide, straight	"	0 1
Ditto ditto ditto circular	"	0 1
Fair ends, not exceeding 3 in. thick	"	0 0
Faces (each flute) any size	"	0 0
Groove or plough, straight	"	0 0
Ditto ditto circular	"	0 0
Moulding, not exceeding 4 in. girth, straight ditto ditto ditto circular	"	0 0
Rounded nosing, not exceeding 2 in. thick, straight	"	0 0
Ditto ditto ditto circular	"	0 0
Beading, not exceeding 3 in. girth, straight ditto ditto ditto circular	"	0 0
Scriming ditto ditto circular	"	0 0
Chinking ditto ditto	"	0 0
Tonguing and grooving	"	0 0
Cross tonguing	"	0 0
Ploughing and tonguing	"	0 0
Spliced cutting, and waste to 12 in. flooring boards or ends round	each	0 3
Returned ends to mouldings, heads, nosings, &c.	"	0 2
Mitre of chamfers, nosings, mouldings, &c., under 2 in. girth	"	0 0
Nosings, not exceeding 6 in. girth	"	0 0
Steps to mouldings, chamfers, nosings, grooves, &c.	"	0 0
Turning table-legs and similar articles	"	1 0

SAWING.

Hand-sawing in seasoned or old Baltic pine	per square	4 2
Ditto American pine	"	3 9
Ditto pitch-pine	"	6 8
Ditto oak, beech, or elm	"	5 10
Ditto European mahogany	"	6 3
Ditto Baltic or American oak	"	6 3
Ditto English oak	"	6 3
Ditto deal	"	6 2
Ripping down old fir or deal, not exceed- ing 4 in. thick	per 100 ft. run	0 4
Ditto oak &c.	"	0 2
Sawing battens, 7 in. deep	"	0 2
Ditto deals, 1 in. deep	"	0 3
Ditto planks, 1 in. deep	"	0 3
For machine sawing take half the foregoing rates.		

PLANING.

Planing by hand, straight	per square	s. d.
Ditto curved	"	12 6
Planing by machinery, straight, 12 in. boards	"	1 9
Ditto, 12 in. and under	"	1 6

Planing on hardwoods is one-third more than
on fir.

MATERIALS SUPPLIED ONLY.

Chalk, dry, fine powdered, for felt roofing felt	s. d.	3 6
Barrel of the same	"	3 6
Felt, inodorous or bituminous, 20 rolls of 12 ft. by 32 in. wide	per yd. yd. run	0 8
Felt, ordinary, ditto ditto	"	0 8
Felt, sarking or sheathing ditto ditto	"	0 8
Nails for ditto, iron clout, 1 in. long	per 100 lb.	1 4
Clout for ditto, roofing, purified, in iron drums	per gallon	0 7
Deal fillets for floors, not exceeding 2 in. by 4 in.	per 100 ft. run	3 6
Oak ditto ditto ditto	"	4 0
Glue-paper, sand or emery	per ream	10 0
Glue, ditto ditto ditto	per 100 lb.	0 8
Ditto ditto ditto ditto	per sheet	0 5

Glue, best town, made	per lb.	0 9
Glue, best Scotch, 60s. per cwt.	"	0 7
Line, worsted, white-cottoned, including per yd. run	"	0 2
Line, patent steel, best white flax, ditto	"	0 1
Line, best plate-steel-flax, No. 6, 100 strands	"	0 8
Line, ditto ditto No. 8, 150 strands	"	0 10
Pencils, carpenter's	per doz.	0 8
Sawdust, white deal	per standard bushel	0 21
Slag wood or silicate cotton slabs, 2 in. thick	per ft. sup. 0 2	
Ditto, 3 in. thick	"	0 4
Ditto, extra quality, 10 lb. per foot cube, and 200 ft. cubic per ton	per ton	15 0
Ditto, ordinary quality, 12 lb. per foot cube, and 200 ft. cubic per ton	"	14 0
Tongues, deal, cross or feather	per 100 ft. run	4 0
Line, ditto ditto	"	6 6
Trenails, ditto 3 in. to 5 in. diam., 5 in. to 3 in. long	per hundred	2 0
Ditto 5 in. diam., 5 in. to 3 in. long	"	2 0
Wedges	per ft. sup. 0 2	
Ditto 3 in. thick in centre, deal	"	0 3
Ditto 3 in. ditto ditto	"	0 3
Ditto 3 in. ditto ditto	"	0 3
Ditto 1 1/2 in. ditto ditto	"	0 4
Ditto 1 1/2 in. ditto ditto	"	0 5
Ditto 1 1/2 in. ditto ditto	"	0 6
Double the above prices for oak wedges.		

NAILES.

Steel, spike, 5 in. and 6 in. long	per lb.	0 2
Ditto, ditto, 7 in. to 10 in.	"	0 12
Ditto, roeched, 12 in.	"	0 2
Ditto, ditto, 12 in.	"	0 2
Ditto ditto 12 in.	"	0 2
Ditto ditto 12 in.	"	0 12
Ditto ditto 12 in. to 2 1/2 in.	"	0 12
Ditto ditto 3 in. to 4 in.	"	0 12
Ditto, cut clasp, 1 in.	"	0 12
Ditto ditto 1 1/2 in.	"	0 12
Ditto ditto 2 in. to 2 1/2 in.	"	0 11
Ditto ditto 3 in.	"	0 11
Ditto, wrought brads, 1 in.	"	0 51
Ditto ditto 3 in.	"	0 31
Ditto ditto 1 1/2 in.	"	0 31
Ditto ditto 1 1/2 in.	"	0 3
Ditto ditto 1 1/2 in.	"	0 22
Ditto ditto 2 in. and 2 1/2 in.	"	0 2
Ditto ditto 3 in.	"	0 12
Springs, glaziers, 3 in. and 3 in.	"	1 8
Tacks, Flemish black, 1 in. to 3 in.	"	0 13
Ditto ditto tinned ditto	"	0 3
Nails, brass-headed, strong, 1 in. to 1 1/2 in.	"	0 23
Ditto ditto ditto 2 in. to 3 in.	"	0 3
Iron clout, strong, 1 in. to 1 1/2 in.	"	0 23
Wax, composition, any size	"	1 0
Copper, various, any size	"	0 02
Wax, composition, mixed	"	0 02

SCREWS—FLATHEAD, ACCORDING TO GAUGE.

	Iron.	Brass.
	s. d.	s. d.
1 in. long	0 51 to 2 6	1 6 to 3 8
1 1/2 in.	0 10 to 5 0	1 10 to 5 10
1 in.	1 03 to 8 0	2 19 to 17 3
1 1/2 in.	1 31 to 8 0	3 3 to 17 3
2 in.	1 10 to 10 0	4 10 to 17 3
1 1/2 in.	1 103 to 15 0	5 3 to 42 0
2 in.	2 0 to 38 0	6 3 to 50 0
2 1/2 in.	2 0 to 40 0	7 0 to 50 0
2 1/2 in.	2 8 to 42 0	10 0 to 54 0
3 in.	3 4 to 45 0	13 0 to 60 0
3 in.	4 0 to 46 0	14 0 to 60 0
Wages, carpenter's	per hour	0 10
Ditto joiner's	"	0 10
Ditto working foreman's	"	1 1
Ditto horse, cart, and man	"	1 4

(To be continued.)

METROPOLITAN STREET PAVING.

THE following appeared in the *Times* yesterday:—At a time when there is so much controversy as to the relative merits of the wood to be used for street paving, will you permit me to draw attention to a new form of pavement known as the sanitary block? Now, that is, to this country, though it has been extensively used in many of the large cities of America for the past 20 years, viz., New York, Washington, Baltimore, Boston, and many others.

Hitherto municipal authorities have had practically to choose between two kinds of pavement—wood and asphalt, both excellent pavements, each having special advantages under certain conditions. Asphalt, for example, is sanitary and durable; its use on main thoroughfares is objected to by many local authorities and their engineers because it is unquestionably dangerously slippery under certain conditions of weather. Wood paving has many advantages, and its introduction into this country has undoubtedly been a great boon to the community, more particularly to Londoners, which those who can remember Piccadilly and other leading thoroughfares in the Metropolis in the old days of stone-paving, which it supplanted, will readily admit. I think I may claim to have been one of the first to recognise its merits—indeed, to be almost its pioneer, as I laid Piccadilly with it when I was surveyor to the late Vestry of St. George, Hanover-square, as far back as 1875.

Wood pavement has the advantage of being comparatively noiseless, fairly durable, and economical, and affords, when in good condition, safe foothold to horses; is easily cleaned, repaired, &c., but it is not non-absorbent, however treated, and it is subject more or less to expansion and contraction. It is, consequently, not the most sanitary.

While, therefore, I do not wish to say one word in disparagement of either wood or asphalt, two of the best pavements hitherto in use, though the selection of the material to be used for the former is a matter of some importance, I claim for the sanitary block that it possesses all the advantages both of wood and asphalt, with none of the disadvantages of either; and I have every confidence that it will, on its merits, win its way in time to public favour.

The sanitary blocks are composed of bitumen from Lake Trinidad mixed with pulverised stone in certain proportions. The bitumen is refined by steam, and is mixed with the necessary flux to produce the asphaltic cement; it is then thoroughly and mechanically mixed with thrashed stone at a temperature of 300° Fahr. The material is then formed into homogeneous blocks, each block being subjected to pressure of 125 tons.

A sample of this pavement may be seen in Carlos-place, Grosvenor-square, where it was laid in 1897; Norfolk-crescent and Chapel-street (off Edgware-road), where it has been recently laid for the borough of Haddington, and the borough of Marylebone, it has also been used for tramways for the Corporation of Cardiff and the borough of East Ham, and may be seen at the entrance to Stafford House and also the entrance to Windsor Castle. The City of Westminster also are going to give it a further trial by having about 10,000 yards of it laid in King's-road, Euston-square.

It may be said that in calling attention to this pavement I am actuated by interested motives, which to some extent is perfectly true, as I am the managing director of the company manufacturing the sanitary blocks in this country; but I write also as a man who has been for over 30 years' standing, having had experience during this period of all kinds of pavement. I may perhaps be credited with some knowledge of the subject and a desire to express an honest and impartial, if not wholly disinterested, opinion.

G. LIVINGSTONE,
Late City Engineer of Westminster.
17, Victoria-street, S.W., Aug. 27.

AUSTRALIAN HARDWOODS.

REFERRING to some statements made about suitable wood for pavements, Mr. Henry Copeland, agent-general for New South Wales, says in the *Times*—I am under the impression that Australia possesses a virtual monopoly of abundant hardwood timber in suitable localities to enable them to compete with the whole world for the most serviceable and durable wood pavement; and, such being undoubtedly the case, it would appear to me a misfortune if any durable wood of haddition were to be estimated or elsewhere, inasmuch as wood pavement in the United Kingdom is as yet only in the experimental stage. Let me assure your readers that in New South Wales we have immense virgin forests, virtually untapped as yet, of hardwood timber trees without an accession of any of the various shipping ports, ranging from, say, 6 ft. in diameter at their base, running up to 250 ft. in height; the larger forests contain numerous glades of arborescent giants with a modest girth of from 24 ft. to 36 ft., and an altitude of from 300 ft. to 400 ft., and the former are as tall as a ballroom. And, the former may be mentioned the blue and grey gum, the iron-bark, the red gum, and the flooded gum; these, however, are generally used locally for railway sleepers and house girders, but the larger and more abundant forest trees, suitable for export for street pavement, include the tall-wood, blackbark, box, wattlebark, mahogany, turpentine, spotted gum, mossmate, and stringy-bark. I have personally examined many logs of these trees which have lain on the ground, to my certain knowledge, for from 20 to 30 years, and they were found as on the day they were felled—close-grained and almost as hard as iron. I have seen other logs, notably of iron-bark, which have been immersed in sea water for 30 to 40 years brought to day-

sent as usual as on the day they were imposed, carrying some very slight signs of the time on the outer surfaces. Samples of these timbers can be seen at this office, 9, Victoria-street, S.W., as well as at the Imperial Institute and the Royal Gardens, Kew.

Why, then, may I ask, should the corporations of the British Empire go outside the Empire for wood pavement on which the residents of the Empire have to walk or drive? Many of your people can never hope to tread the forest of Australia, but they may at least be enabled to wend their way to their offices and homes by placing their solid British feet on the block of the health-giving and microbe-destroying eucalyptus plants of the Australian forests.

THE WIDENING OF LONDON BRIDGE.

LONDON BRIDGE will soon be closed for the extension, widening, and raising. So far back as twenty years a scheme for the enlargement of the bridge was devised, but rejected. Since then other proposals have been made, and a scheme was prepared, approved by the Corporation, and passed by Parliament in the session that closed.

Under the new scheme the roadway will be widened 3ft., from 31ft. to 34ft., and each of the footways 3ft., from 9ft. to 11ft. The old balustrades, with their solid masses of stone, will be replaced by open balustrades (after the style of Waterloo Bridge). The bridge will be lighted from the centre, with the electric light, and passages for pedestrians will be provided round the electric light columns. Lastly, the bridge will also be provided with a better system of drainage than it has enjoyed hitherto, while the roadway will be repaved with granite. To prevent too much inconvenience to those using the bridge a temporary wooden foot-bridge will be constructed outside the present footway, its weight being carried on the buttresses of the bridge. Altogether, these improvements will cost about £100,000, it is calculated that each side of the bridge will be closed over twelve months, so the new London Bridge should be ready for us in a little more than two years from now.

WORKHOUSE MEN AND BOYS VISIT A CARVEE'S WORKSHOPS.

THE male inmates of the Exeter Workhouse, as well as the elder juveniles, male and female, accompanied by Mr. J. H. Bellamy, the master, visited, on Friday afternoon, the well-known art studios of Messrs. Harry Jones and Sons, in Longbrook-street, Exeter. They were received by the senior member of the firm, and all examined with great interest the various departments. The use of the skeleton and the art of modelling were fully explained to them, and the process of converting huge blocks of stone into noble and sturdy batts of English oak into the beautiful figures of saints and virgins was watched with no little intelligence by young and old. The statues who were busily converting great blocks of grey Dartmoor granite into some memorials to stand upon the graves of the noble dead, there to mark the last resting-places of British officers who have fallen, attracted a melancholy attention. In the wood-carving shops, a pale youth with a crutch—one of the visitors produced a carved wooden kiltie stand, which the professional experts at work considered showed more than ordinary ability.

This circumstance produced an interesting story from Mr. Harry Jones, relative to a former inmate of Exeter's workhouse. A fatherless youth, John Way, was brought up, as a child, there in the middle of last century, and afterwards was apprenticed by the workhouse to a cabinet-maker. Later on, the youth, showing distinct artistic genius, became attached to Mr. Jones's staff, whereupon he remained several years. Then he went to London, and having, by his remarkable ability, attracted the attention of the late Sir Gilbert G. Scott, R.A., who was then engaged in the early '70's restoring the interior of Exeter Cathedral, was sent down there as chief wood-carver. In that capacity he remained some three years. The restoration of the Bishop's Throne, the finest thing of its class in the world, and the north of the equipt-arch, which was taken down from the chancel of this once humble workhouse by John Way. Early hardships, however, had left upon a naturally delicate constitution, and he died of consumption in the village of Birtou

in 1878, at the age of twenty-nine years. After a very instructive year or two in the studios, the party adjourned to Mr. Jones's beautiful grounds at Fair Park, adjacent to the studios, where upon the lawn, and beneath the shade of the mature mulberry trees, tables were spread, and the good things laid thereon were done infinite justice to by the visitors. Then an ounce of tobacco and a long clay pipe were served to each of the men, and fruit and sweets to the children, and a very contented time spent. Later on the grateful party would their way home to the "Great House."

THE SIMPSON TUNNEL.

A CORRESPONDENT of the *Times* gives a description of the tunnel now being cut from Brieg, on the Jura-Simpson railway, to the Italian side of Mount Simplicio. He compares it to the work which has already been done in the way of tunnelling the Alps. The Mont Cenis Tunnel has a length of nearly eight miles, and all trains have to attain an altitude of 4,248ft. above the sea level. The Arberg is 6½ miles in length, with a height of 4,300ft. The Gotthard is 9½ miles, with a height of 5,378ft. The Simpson Tunnel, now in rapid course of construction, will be 12½ miles in length, but with the great advantage over the others that its traffic has not to be taken to a greater altitude than 2,314ft. above the sea level, or 1,474ft. less than the case of the St. Gothard. In other words, the level of rails at their highest point is only 60ft. above the present railway at Brieg Station, so that no costly approaches nor helical tunnels are required to gain access to the tunnel at its north end, nor will the haulage of trains be so heavy as in the case of the other tunnels. The work will at first consist of one single line tunnel, lined with masonry throughout, and one parallel passage or "heading" 10ft. in width by 8ft. in height, preparatory to a second tunnel, placed 56ft. apart axis from axis. When the traffic necessitates a second tunnel it can be completed for about one-third of the cost of the first tunnel. The experience gained during the construction of the previous tunnels is being turned to very good account, and is resulting in a great saving of life, in much greater comfort for the men, and in greatly abbreviating the period of construction.

By the end of the present month August, the aggregate length of mountain pierced will be about 9,868 metres, or 10,790yd.; out of a total distance of 19,730 metres or 21,564yd., thus rather more than half the distance will probably have been pierced. The work was begun towards the close of 1898, during which year the distance was 447 yards; by the end of 1899 the distance attained was 4,227 yards; by December, 1900, 7,947; and by the end of this month August it will be about 10,790 lineal yards. The rock through which the tunnel is being driven is exceedingly hard, consisting of granite and gneiss, with veins of white quartz; but in consequence of the adoption of the Brandt drill, the galleries on the north side are being advanced daily by a distance of no less than 21ft. 3in., an unprecedented result, and certainly four to five times what was the case with the tunnel in the south of Britain, through similar material. The drill is 3in. in diameter, slowly rotating, but kept up to its work by hydraulic pressure of 1,300lb. to the inch, or of ten tons on the cutting points of the drill, and as all the waste water is directed along the top of the hole, right up to the cutting edge, the temperature of the steel is kept cool, and the débris is washed out of the hole. The ventilation is excellent: the air is supplied to the men right at the end of the galleries in great amounts, over 58,000 cubic feet of air per minute being supplied. The weight of the rock at the mouth of the tunnel is great superincumbent mass over the tunnel, the temperature of the rock is as high as 89° Fahr., and special arrangements are made by the employment of spray and of ice for cooling the air. The total quantity of water flowing from the tunnel, inclusive of the water from the south entrance, is rather under 5,000 gallons per minute, and is carried in efficient tie-drains cut in the rock. The greatest care is taken for the welfare of the men: they change shifts every eight hours, and are brought out in train-loads. They are not allowed to work in the north and south entrances emerging from the tunnel in their wet clothes, but are landed in a covered building or station, in which there are cubicles for changing their clothes, fitted with hot and cold douche-baths.

They take off their mining clothes, which are at once hung up in heated rooms to dry, ready for their next day's work. Adjacent is a restaurant at which they can get all their meals, of excellent quality at a very low price. The contractors for this great work are Messrs. Brandt, Brandan, and Co., represented by Colonel Lecher. This gentleman was anxious that Sunday should be observed and work suspended; but the Italian workmen, who are desirous of earning as much wages as possible to remit home, objected, and insisted on working seven days per week. Work, therefore, goes on incessantly from one year's end to another, with the exception of four or five days which are particular feasts, or are days which the special Government authorities appoint for stopping work. The tunnel requires cessation of work for getting their lines into the tunnel from their telescopes and theodolites. It is expected that the traffic will begin to run in 1904, and the total cost when both tunnels are completed will be about £50 per lineal mile of single-line tunnel, a remarkably low figure when the difficulties and the magnitude of the undertaking are considered.

NEW REGULATIONS FOR THE PROTECTION OF THEATRES AND OTHER PUBLIC BUILDINGS FROM FIRE.

WE have before us the London County Council's Regulations made on the 30th of last month by the London Council, 1891, for the protection from fire of theatres, houses, rooms, and other places of public resort within the administrative County of London. We can now only give a very brief résumé of the provisions. Clause 1 refers to the intention of any person to open a theatre, or other place of public resort, or to make public subscription to erect such exhibitory a notice board on the proposed site, or by advertisement in the newspapers. An application in writing is to be made to the Clerk of the Council for a certificate under the Metropolitan Management Act, 1861, and under the London Building Acts, 1891. The application to be accompanied by plans, elevations, and sections in duplicate to a scale of 1in. to the foot, and by a block plan to 1/4in. to the foot. A plan and section of the drains to be laid are also to be submitted. The plans are to be submitted to the Council, and the Council are to be accompanied by various parts of the premises, and the area to be given to each person, and to be accompanied by a specification of the works, material to be used, &c. Clause 2 deals with the site, and provides that one-half at least of the total length of the boundaries of the site, and any premises which consist of one site, building, and in case of a room, not consisting of one site, building, one-half at least of the total length of the boundaries of the site of the building, of which such room or other premises form part, shall abut upon or front to public thoroughfares, of which one at least shall not be less than 40ft. wide, and of the remainder none shall be less than 30ft. wide if a carriage-way, or 20ft. if a footway. The frontage of the site to a thoroughfare not less than 40ft. wide shall not be less than one-sixth of the total length of boundaries of site, and in the case of 3, 4, and 5 sites, the site, or sites, which the site shall be constructed under or on the top of any part of any other buildings. No openings to be made in walls or roofs of such premises within 20ft. of any adjoining property unless a brick wall of the thickness prescribed by the Building Acts, 1891, be built up to such height that no part of any opening in such premises or in any building which may be erected on such adjoining property shall be higher than the part of the wall opposite to it. All such premises are to be enclosed with a proper wall, and the walls of brick and stone of the prescribed thickness. No. 6 says the floors, tiers, and roof of auditorium, and all parts used by public shall be of fire-resisting materials to the Council's satisfaction; and if the flooring is of wood, and is laid on joists, the joists shall be held with iron tongues. No. 7 limits the number of tiers to three, including the gallery, above level of the pit. No. 8 provides that where the first tier or balcony extends over the pit-stalls or area, the height between floor of pit and the first tier shall not be less than 10ft. and the height between the floor of highest part of gallery and the lowest part of ceiling over same is not to be less than 12ft. Height between tiers is not to be less in any case than 8ft. No. 9 says the pit floor at the highest

part, or of the stalls, where there is no pit, shall not be more than 6in. above the level of the street at the principal entrance to the pit, and the lower part of the floor of pit or stalls is not to be lower than the level at which it can be drained by gravitation into sewers, nor more than 15ft. below the level of street at principal entrance to pit. No. 10. Two separate exits are to be provided from every tier or floor which accommodates not more than 500 persons; when it holds more, an additional exit is to be given for every 250, or part of 250 persons above 500. Each of the exits to be not less than 3ft. wide. When the tier or floor accommodates not more than 300, two ft. exits are required. Other details are given in this clause 10. Subsequent clauses define the widths of lobbies, corridors, and passages; that when vestibules are provided not more than three tiers or floors (when provided, not more than five) of such parts of tiers shall communicate with one vestibule; all staircases from tiers or parts holding not more than 300 persons are to be at least 4ft. wide, and those from tiers, &c., holding more are to be at least 5ft. wide. These staircases to have solid square steps and landings of York or other equal quality, and other means of fastening and material may be approved. Various details follow as the treads, which are not to be less than 11in. wide, and have risers not more than 6in. high; the flights, thickness of landing, handrail to be fixed on both sides, &c. All exit doors to be in two folds and open outwards. No door shall open upon a flight of stairs, but a square landing at least 3ft. in width shall be provided between such steps and doorway. All the doors to have automatic bolts of a pattern to be approved. All doors and gates for entrances to be made to open both ways. The seating area assigned to each person not to be less than 2ft. deep and 1ft. 6in. wide. In the houses with no seats, benches or arms are provided, and not less than 2ft. tin, deep by 1ft. sin. wide where backs and arms are provided. A space of 1ft. to be allowed between the seats.

No. 21 provides that in all such premises where a stage with a proscenium is erected, such stage shall be separated from auditorium by a heavy proscenium wall not less than 13in. in thickness, to be carried up intact to 3ft. above roof. Not more than three other openings are to be made in such wall, and no such opening is to exceed 20sqft. in area, such openings to be closed by wrought-iron frame to sit as close of itself without a spring, and to have a 3in. pl. The roof over stage is not to be of fire-resisting or heavy construction, and shall have an opening at the back thereof equal at the base to 1/4th area of stage. Such opening is to be glazed at top and sides with sheet glass of 1/2 in. thick and covered over being opened by the action of lowering the fire-resisting screen, or by the cutting or burning of a cord to an extent equal at least to the superficial area required at the base of the opening. Exhaust coils to be placed on stage roof.

The dressing-rooms are to be provided in a separate block of buildings, and separated from building by party-walls with approved communications, and all the materials used to be fire-resisting. Other clauses refer to workshops, linelight, tanks, boilers and dynamos, ironwork, inflammable liquids, partitions, &c. All wood-work of the stage to be rendered non-inflammable or be of non-combustible material. The gas, with separate and distinct gas service and meters to the stage, auditorium, to staircases, corridors, &c., and other regulations for oil or candle lamps, sun burners, ventilation, hydrants, and other appliances and fittings are described in clauses 32 to 46. We have here tried to summarise the leading structural conditions imposed on the promoters and builders of theatres and other places of public resort. A great deal is left to the option of the Council, such as the electric lighting and heating and ventilating arrangements, and they reserve to themselves the right to modify or dispense with those regulations in special cases. A few of the regulations may be considered rather too stringent, and no doubt other objections will be raised; but of these points we forbear to speak now.

THE "EMPERESS" COMBINATION BATHS.

MESSRS. WRIGHT, SUTCLIFFE, AND SON, of the Globe Sanitary Works, Halifax, are the manufacturers of baths possessing many important advantages, not only in the reduced weight of the bath and its incor-

corrosive qualities. The "Empress" combination bath is made in best tinned steel, tinned copper, and aluminium. Several advantages are claimed—it is lighter than any other bath; will lend itself to any style of decoration; does not rust; no casing is required; every part is clean and accessible; is does not cool the water as other baths; it is strong, durable, cheap, and can be adapted to any class of fittings. Several kinds of bath are illustrated in the catalogue, which are light, parallel in shape, elegant and decorative in finish. Sutcliffe's patent parallel "Empress" bath, tinned or lead-coated steel, enamelled sea-green, white, pink, or cream inside, is fitted with strong polished mahogany, walnut, or oak top, and is stencilled outside picked out in colours. It is fitted with prize medal gun-metal taps, 14in. stand pipe, overflow and brass trap, and is supported on ornamental iron feet. A bath of this description 31, 6in. inside, 19in. deep, 23 1/2 in. wide is priced at £7 7s. Another bath of similar description "B" is only £5, and a third, No. "D," is even cheaper. Several designs are illustrated. The more expensive baths have a higher decorative finish and superior bath taps and fittings, but they are of the same general construction. One great advantage of these baths is that they are not cased, and occupy little room compared with the insubstantial mahogany-cased bath.

A SULPHUR AND SAND CEMENT.

"PROFESSOR" BROWN, a St. Louis man, is said to have invented, or rediscovered, a combination of sand, cement, and sulphur, which he claims possesses qualities far superior to concrete, and which can be produced at less cost than any material.

Professor Brown claims for his new discovery that it is acid proof, a non-conductor of electricity, waterproof, a non-conductor of heat and cold, and that it is indestructible, being impervious to all attacks of fire, temperature, climate variations, time, and decay. The compound can be mixed and moulded upon the spot where it is to be used, and when dried it becomes as hard as granite, and will take a high polish.

Besides being valuable for house construction, the new material is available for use in the construction of sewer-pipes, electric wire conduits, and water-mains. In art and decorative work it is also expected to be of use.

Professor Brown owns a piece of material which he says is known to have been taken out of a building erected 1,500 years ago, and he declares it to be the same as this new compound.

HANGING PAPER ON CEILINGS.

WHEN the face of plastered walls is not good enough to turn out a fair job of distemper a new surface is attained by lining them with paper. In papering a ceiling with lining-paper, it is better, says the *Painter's Magazine*, that the edges of the lengths should barely meet than that they should overlap. In cutting ceiling papers to the angles formed by the wall, the less cracks in ceilings generally, one edge will be found to be slightly drooped below the other. In this case the crack requires to be cut out before stopping. If it were not, after lining it would show as a sharp, irregular line. The only remedy is to enlarge the crack, more or less, according to its importance, by scraping or cutting it out with a stopping knife. For stopping large cracks a stopper—a knife with a flat about 1/2 in. wide—a very serviceable tool—might be used with great while remarking here that

where walls or ceilings are to be finished in distemper, without previous papering, it is best, in stopping, to discard steel knives, which scrape and disfigure the face of the plaster, and use a putty knife, which shows through the subsequent coat of distemper. Use, instead, a tool made of wood and shaped like a stopper, and use it in the same way. As to the stopping, it is generally made of plaster of Paris, with white lead. Sometimes, when convenience renders it necessary, some add a few drops of size to the mixture, to prevent its too rapid setting. It is surprising, to one not familiar with it, what an effect the plaster of Paris will have, at the same time, it is generally considered that the stopping is better without this addition. Always wet cracks, &c., thoroughly before putting in the plaster, otherwise it will not adhere for any length of time.

But to return to the paperhanging. In lining a ceiling, start the paper from the wall nearest the window, and work towards the door. The reason of this is that, if there should be any uneven, or overlapping edges, they will be facing the window, and therefore not visible from the door or main part of the room—that is, in a room of ordinary shape. If, on the other hand, the paper were to be laid with the overlapping edges, which, even with the most careful workmen, are bound to occur, throw a shadow line, which, under usual conditions, would be almost certain to catch the eye.

In papering a ceiling, proceed in the same way as for walls. Find the length of the pieces of paper to go from wall to wall, and cut the number required. Arrange a scaffold so as to have the plank running close up to and parallel with the wall, so that the first length is to be hung. Ceiling lengths are generally longer than a wall requires. Fold them with a long fold at the top—or starting end—and a very short fold at the bottom or finishing end.

The first length has no previous one to match to. We shall, therefore, for convenience sake, consider it hung, and will describe the manner of getting the second up, which description will apply equally well to all those that follow. The first length is to be hung, this as a rule, there is not much variation necessary, except when the lengths are very long. Say men are on a moderately-sized room. Make the first fold as large as the board of the scaffold, and the bottom one much smaller. The next operation is to hang it. In hanging ceilings a roll or portion of a roll of paper is necessary as a support to the pasted lengths. Insert this roll beneath the top portion of the pasted length on the board of the scaffold, and the bottom one on the scaffold. Have the plank running parallel with the length previously hung, and have the inside edge of it directly under and in a line with the outer edge of the first length hung. This is important, as it will be the last length hung. The last length will have the scaffold too high, but sufficiently low to allow the body, arms, and eyes full play. Start from the right-hand wall with your back to the last length on the ceiling. With the left hand, take the right-hand extreme corner of the length by the inside edge. Now open the first fold and move the supporting roll about until we have 2ft. or 3ft. between the two hands. If we succeed in placing the roll in the middle of the ceiling, the remainder of the length, however long, if the ceiling be true, will find its place almost as a matter of course.

Hold the length up to the ceiling, with arms outstretched, and work it about, within an inch or so of the ceiling until we have settled the correct place in which it is to go—but do not, on any account, allow it to touch yet—and, when this is settled, with the right hand catch and place the top portion of the ceiling. Now we have the top portion directly over the supporting roll held by the left hand. Though the right hand should not be allowed to shift yet, it must be used as a pivot for the portion over the left hand to be carefully worked into place by the edges of the space between the two hands match correctly, temporarily press the roll on the ceiling, run the right hand along the edge, to fix the match, and then, still holding the roll, take the brush from the pocket and brush down the first fold two or three papers. If the length be correctly started in this fashion, all we have to do is to move the supporting roll along under the paper, a foot or more at a time, and brush down by a brush stroke on the middle of the length, followed by others towards the edges, keeping the roll in the left hand always an inch or two away from the ceiling.

If the first fold of the edge is perfectly parallel with the edge of the previous length, the whole length will brush into its place without the least trouble. But if the edge over the left hand is a trifle out of the square, while a correct or true starting point, it will mean that the overlap will gradually increase as the length is brushed on, until at the finishing end it may be a half inch or more. If, on the other hand, the edge is not quite parallel, overlapped, and the whole match is consequently bad. If, on the other hand, it overlaps slightly at the extreme starting-point, and is just where the supporting roll is, it will be found that before many more feet of the paper is brushed on, the match will be the fourth previous length, and that being hung will appear to be growing gradually wider apart, leaving a considerable space of the ceiling bare, and

necessitating either that the length be taken off and reattached or else subjected to a considerable amount of leaching and twisting, which will have to be repeated in hanging subsequent lengths.

Never allow the pasted side of the paper to touch the ceiling until it is leached into place. Keep the roll supporting the pasted length always a few inches away from the ceiling. When we come to the small end fold, however, the roll may be temporarily placed firmly against the ceiling whilst the folds are being unrolled.

Papering a large ceiling is really little more difficult than doing a small one, the only extra trouble being in handling the large body of pasted paper. But the secret of success is to correctly match the first foot or two. The method of folding the pasted lengths needs to be varied somewhat. The method generally adopted by the best paper-hangers I have known is altogether difficult to describe, but is as follows: Paste and fold the first part resting on the board, but partly unfold it back until the extreme end rests on the turning point of the large fold. The first long fold is, in fact, half unfolded again. This gives us two short folds with a portion of the pasted side upward. Draw the length along and paste, fold, and again half unfold the second portion. The same method may be continued as long as necessary, the final fold being an ordinary short fold in the opposite direction. Now, to hang the length, place the supporting roll directly under these numerous folds. With the left hand, with the roll, support the pasted fold, which must not be allowed to touch the ceiling, whilst the right hand is at liberty to fix the matching edge in its place and then brush the paper down. The short folds on the supporting roll are of great use in unrolling of themselves as the operator moves along the plank.

CHIPS.

Major De Witt, representing the Board of Trade, made an inspection of the portion of the Highland Railway that has been doubled between Dalnaspical, the highest point on the line, and Blair Atholl. The inspection officer was accompanied by Mr. F. A. Wilson, general manager; Mr. M. Deane, superintendent of the line; Mr. William Coleridge, chief engineer; and Mr. A. Mackenzie, general manager of permanent way.

After the opening, probably in October or November, of the South Londashire Company's electric line, now in course of completion, between Knotty Ash to Hayton, electric communication will be continuous between the Liverpool Pierhead and Hayton, while an alternative route through the same outer district is projected.

The report on the work of the Edinburgh Fire Brigade for the year ending May 15, 1901, has just been issued by the Firemaster, Mr. Arthur Forlidge. During the year the Brigade received 508 calls. The loss of property by fire during the year within the city was £13,553, while the value of the properties, including contents, was £775,697. The loss by fire within the city during the past year was exceptionally slight compared with recent years, there being 16 less calls and 14 less losses than during the previous year. The net cost of the department for the year was £8,374.

It is officially announced that the Earl of Rosebery will be present at the national commemoration of King Alfred at Winchester, and will perform the ceremony of unveiling the colossal figure which has been sculptured by Mr. Hamo Thornycroft, R.A. The ceremony of unveiling will take place on September 20.

In the death of Alderman William Burn, which occurred at his residence, Oakley, Tottenham, on Friday, that town has lost one of the most prominent public men. He was first returned to the town council in 1881, was mayor in 1883-4, and was elected an alderman in 1885. He was the head of the firm of Messrs. William Burn and Sons, cabinet-makers, &c., a business which he established in 1864. He was sixty-five years of age.

The first section of the electric tramways being constructed by the Corporation of Stockport was inspected on behalf of the Board of Trade on Saturday. This route is from the tramway depot, Mersey-square, in the centre of the town, through Bertwood, Mellor, and Woodley village to the Hyde side of Woodley station. The Corporation of Hyde will construct a continuation line from Woodley to Hyde, and form a junction with the lines of the company now running cars between Hyde, Denton, and Ashton.

Mr. Charles Lyman, F.R.I.B.A., of Stoke-upon-Trent, writes that the so-called Druidical circle at Ailor Low, near Hartington, has for some time been in the hands of experienced explorers, appointed by the Anti-Archæological Institute, and that their efforts have been rewarded by the discovery of the skeleton of a man of the Neolithic age. The remains were found not far from the surface and in the centre of the circle. The excavations were superintended by Mr. St. George Grey, who worked with the late General Pitt Rivers.

OBITUARY.

The death occurred on the 21st inst. of Mr. ROBERT ISAAC BENNETT, F.R.I.B.A., of Cooper's-street, Manchester. For many years, in partnership with Mr. W. A. Royle, he has been actively engaged in professional work. Thirty-five years ago the firm took over the business of the late Mr. Philip Nunn, an architect, who, although young in years, had, at the date of his death, acquired considerable reputation. Both members of the firm were pupils of Mr. Dunn. Mr. Bennett was held in high respect in his profession, and the members of the Manchester Society of Architects some years ago elected him as president. The firm of Royle and Bennett have, during their long professional career, undertaken many important buildings in the city and neighbourhood—particularly schools, having erected for the Manchester School Board no fewer than ten buildings, amongst them the Higher Grade Schools at Chetham. They also designed the Government buildings, and Mr. Bennett joined the Royal Institute of British Architects as a Fellow in 1888. The funeral took place at Prestwich Parish Church on Saturday. With the relatives and friends at the graveside there were representatives of the Concord Masonic Lodge, the Friendship Lodge (44), and the Manchester Society of Architects.

Mr. JAMES COWIE, architect, Douglas, Isle of Man, died on Wednesday last, suddenly, from a heart ailment (while hurrying to catch the midnight boat for Glasgow), aged 62 years. He was a native of Liverpool, and in addition to carrying on an extensive practice as an architect, held the positions of Government valuer, surveyor of ecclesiastical buildings, and surveyor of government buildings. Several public buildings in the island were designed and superintended by him, these including the Tynwald Court Chamber at Douglas, the Poor Asylum, the Rolls Office, and the Douglas Railway Station. He had held the office of diocesan surveyor under the Manx Concord since the establishment of the post by the Ecclesiastical Dilapidations Act of 1871, and was universally esteemed by the clergy of the island.

Mr. OLIVER NORMAN, farmer and contractor, New Passage, died suddenly at Temple Meads Station, Bristol, on Monday, aged 74 years. Brought up to a sedentary life, he took to farming upon the Bristol Downs, and became joint proprietor of an hotel. From time to time he undertook considerable railway and other contracts, and he was associated with the late Mr. Charles Richardson in the earlier stages of the Severn Tunnel works. He became associated with the promoters of the Oxford and South Wales Railway, and his first contract with that company consisted of excavations at Flinzing. Mr. Norman afterwards took a contract in connection with the Severn Tunnel, including the sinking of one of the shafts on the Monmouthshire side of the river, and the perpetual work of driving the headings. On the Gloucestershire shore, for instance, where the heading came very near the muddy bottom of the Severn, falls occurred, and sea-water came into the workings in consequence. The chief hindrance, however, was met on the other side, where a very large fresh-water spring was tapped, and this, in the end, led to the work being done by a large firm of contractors—Messrs. T. A. Walker and Co.—who carried on the undertaking to its completion. For some years he maintained a successful business at Tintern in making boxes for the tin-plate trade at Swansea. He also worked the stone quarries at Fox's Wood.

Upon the 21st instant, at his residence in Rosemont-road, Richmond Hill, near London, Mr. CHARLES ABNEY passed the sixtieth year of his life. Mr. Abney was an architectural sculptor, widely known and universally respected by all fellow members of his profession. A clever stonemason, and no mean sculptor withal, "Charlie" Abney was one of the best of good fellows, and made himself popular in the various walks of life. In the early '60s he was for some years in partnership in Dublin, with Mr. Charles W. Harrison, at present the senior member of the firm of Messrs. Harrison and Sons, the well known monumental sculptors of Great Brunswick-street. The late Mr. Abney had a large family, and some married daughters to mourn their loss.

The death took place at Fairpark-road, St. Leonards, Exeter, on Sunday, of Mr. WILLIAM GINSON, contractor. Deceased was born at Bankhead, Monkie, county Forfar, on June 18, 1852.

He left Scotland at the age of 16 and worked in Newcastle, afterwards going to London, where, at the age of 19, he was engaged on various large works. Six years later he came to Exeter, and acted as foreman for Mr. Luscombe, in connection with the Lady-chapel of Exeter Cathedral and other important undertakings, including the restoration of the choir. About twenty-one years ago he commenced business for himself, and has since then been in the town of Exeter, contracting being the new tower to Mistley Church, Essex. After this he took up contracts for the erection of villas in Tiverton-road and Union-road, Exeter. He was also intrusted with large contracts in Devon, Cornwall, Somerset, Dorset, London, &c., while at the time of his death he had large works in hand at Weston-super-Mare. Deceased leaves a widow, three daughters, and a son.

Mr. ROBERT GEORGE SEAMAN, builder, of Crown-street, Ipswich, whose residence was at Priory-place, Friars-street, fell from a scaffold on Wednesday in Stirling-street in that town, and sustained terrible injuries. He was at once removed to the Ipswich and East Suffolk Hospital, and died within a few minutes of his admission. The accident occurred at some premises in course of erection, in which the deceased was paying a visit of supervision.

COMPETITIONS.

BEXTON.—At the last meeting of the urban district council, the report of the assessor, Mr. F. H. Oldham, F.R.I.B.A., of King-street, Manchester, on the designs submitted for the Thermal Water Pump, forming the local memorial to Queen Victoria, was read as follows:—"I have carefully examined the five several sets of drawings numbered 1, 2, 3, 4, 5, and read the notes so far as they accompany them. I have no hesitation in placing design No. 1 first, and to which I have attached a red star. Having taken out the quantities somewhat roughly, I think the work should be carried out for the sum you name—£1,000—or within a reasonable percentage of that amount. Designs No. 5 and 2 are respectively second and third, and stand some distance behind the one I place first." The award was accepted, and it was agreed that the premium be paid the successful competitor, such premium to be ultimately merged, however, in the commission. The chairman then opened the envelopes, which showed that No. 1 was Mr. Gustav Agate, of Pendleton; No. 2, Mr. Charles Swain, College-road, Buxton; and No. 3 in order of merit, Messrs. Warren and Cargill, of Matlock. It was decided that the designs should be exhibited in the free library.

EXETER.—The board of guardians for Exeter resolved on Monday to proceed with the scheme of alterations to the infirmary, and confirmed a resolution directing:—(1) That architects be invited to provide drawings for a new hospital for 150 at a cost of not exceeding £80 per bed, the total cost to be £12,000; (2) That the hospital be built in sections, as circumstances may require; and (3) That a new wing, comprising administrative block, labour wards, isolation wards, and children wards, be taken in hand as soon as arrangements can be made."

The Century Theatre, in the Strand, which has hitherto been known as the Adelphi, will reopen early in September. The auditorium is entirely new. The stalls, numbering upwards of 200, are now approached direct from the main entrance. The dress-circle has been brought forward, considerably enlarged, and seats 170; the upper circle has also been extended and seats 250. The prevailing scheme of the decorations is ivory white, yellow, and old gold developed in silk velvet. The theatre is heated on the low pressure system, and there is an installation of electric light. There are numerous exits leading into wide and spacious corridors.

A stained-glass window in the east end of Agargay Parish Church was dedicated on Monday to the memory of Mr. Bruce Tomkinson.

The Consett Iron Company have purchased 21 acres of land at Derwent Haugh, near Dunston-on-Tyne, which forms part of the Carrington estate, for the purposes of extending their works. Messrs. Mawson and Co., Newcastle, have leased ten acres of land near at hand to the Consett Company on which to erect a glass factory.

The well-proportioned tower of St. John de Sepulchre Church, Norwich, is being restored. The curious bell canopy at the top of the tower is being removed, and pinnacles will be added at the angles of the tower.

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ILLUSTRATIONS.

THE NEW STRAND IMPROVEMENT SCHEME. MR. ERNEST RUNTZ'S SUGGESTED DESIGN.—SECOND PRIZED DESIGN FOR BLUE-COAT HOSPITAL LIVERPOOL.—THEATRE AT MOTHERWELL.—FRIARY CHURCH AND SCHOOLS, WEST BEIDFORD.—DETAILS OF BATTLE ABBEY.

Our Illustrations.

STRAND IMPROVEMENT SCHEME.

LAST week we gave a drawing from the Royal Academy Exhibition of Messrs. Runtz and Co.'s design for the New Society, now in course of building. To-day we supplement that illustration with a more general view of the same architect's scheme for the treatment of the Strand. The picture was hung in the line at Burlington House, but the conception will not be realised as here depicted. We have nothing to add to what was said in our descriptive note with the illustrations last week.

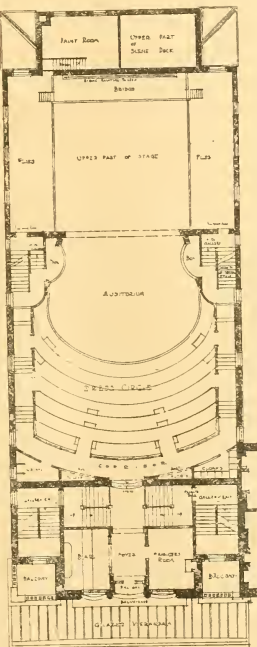
BLUE-COAT HOSPITAL, LIVERPOOL.

TO-DAY we follow up our illustrations of the selected design for these new buildings August 2 by giving an illustration of the plan placed second in the list by Mr. Carter, the assessor. The authors are Messrs. Woodfall and Eccles, of Liverpool, who think that no further comment is needed after the description of the scheme has already appeared, the plans speaking for themselves. Messrs. Grayson and Vahl's design for the same work appeared in our issue for August 16.

FRIARY CHURCH AND SCHOOLS, WEST BEIDFORD, NOTTINGHAM.

IS the early part of 1897, owing to the decreased residential population of the city and the rapidly increasing population of the prosperous suburb of West Bridgford, the committee of the Friary Church, Nottingham, received the sanction of the Charity Commissioners to dispose of the property and appropriate the proceeds towards the erection of a church and schools in the parish of West Bridgford. In 1898 the building of the schools was commenced, and opened in 1899. The church was commenced in 1900, and will be completed during this year. The church has been planned with a nave and side aisles; the latter will be used as passages so that every seat will command an unobstructed view of the pulpit. At the corner of Musters-road and Mill-cent-road is a tower 60ft. high, having two entrances; at the opposite corner is a porch entrance which is connected with the tower by a narthex. There are five entrances to the church. On the north side of the choir is the organ-chamber, and on the south the vestry. A large meeting-room is provided behind the choir, which will also be used as a choir vestry. The floor is of wood. The entrances and lobbies are tiled. The roof is on the open hammer-beam principle, covered with green slates. The church will accommodate 450 persons. The external facings are of Coxenbach stone with Ancaster and Derby-

shire stone dressings. The arcade piers are of stone, the lower portions with wood cladding. The woodwork of the roofs, doors, &c., is stained green. The school comprises hall, 56ft. by 26ft. wide, ten classrooms ranged on the sides of the hall with folding partitions so that the classrooms may be thrown into the hall, thus giving extra accommodation when required. The superintendent's room, library, and young men's room are near the boys' main entrance to the school. A room for ladies is provided with a spacious kitchen near the girls' entrance. All these rooms have separate entrances from the several lobbies, so that access may be had to them without the necessity of going into the large hall. Two of the classrooms—one on either side of the platform—are so arranged as to make convenient retiring-rooms for speakers and others. Advantage has been taken of the necessarily deep foundations to form a large store-room under the



NEW THEATRE AT MOTHERWELL.

building. The roof is of open timber-work with wrought-iron ties and principals. The windows in both the church and schools are glazed with tinted sheet glass. A portion of each window is made to open. The contractors for the church are Messrs. Garton and Burton, and for the schools Mr. W. Maule. The architect for both the church and schools is Mr. Ernest R. Sutton, of Nottingham.

NEW THEATRE, MOTHERWELL, N.B.

THIS building is in course of completion, and is intended to be opened early next season. The house is divided into pit, stalls, dress circle, and gallery, and each section has two staircases. The seating capacity is for about 1,300 persons. There are no pillars in the auditorium. The whole constructional work of the dress circle and gallery is of steel and concrete, and is therefore fireproof. The seating in every part of the house is so

arranged that an unobstructed view is obtained of the stage. The lighting will be by electric light. The architect is Mr. A. G. G. G. G. G. G. F.R.I.B.A., of Hamilton, N.B. The illustration is taken from the perspective exhibited at the Royal South Academy this year.

BAFFLE AND V. S. S. S. S.

(See descriptive article on p. 270.)

CHIPS.

IN the case of Charles Edward Hall, of Chesterfield, Derbyshire, builder and contractor, the order of discharge from bankruptcy has been suspended for three years ending July 19, 1901. In that of John Lewis, of Portbury, Glastonbury, builder, the order of discharge has been suspended for two years ending June 6, 1903.

The urban district council of Hampton are about to purchase the Rosell Estate for £5,300 in connection with their scheme for new offices and workmen's dwellings.

Plans have been adopted by the St. Pancras Borough Council for the erection of blocks of industrial dwellings on cleared sites in Brantome-place, Euston-road, and Prospect-terrace, Gray's Inn-road, respectively, providing accommodation for 581 persons. The total estimated cost is £32,367.

The Guardians of the Wandsworth and Clapham Union have decided to erect an intermediate school for children on land adjoining the workhouse at a cost of £15,000. The guardians have also accepted the tender of Messrs. Huntley Bros., at £5,000, for the erection of cottage houses for aged and deserving couples.

The Sheffield City Council have decided to remunerate their city surveyor (Mr. C. F. Wike for extra work performed in connection with the promotion of the Sheffield Corporation Acts, 1900 and 1901, by a grant of 500 guineas.

At a recent meeting of the Dundee Harbour Board it was stated that the board was committed to a further outlay of £23,374 for works already in progress or authorised.

An inquiry has been held at Southend-on-Sea into the application to the Local Government Board of the corporation for sanction to borrow £10,000 towards the cost of widening the bridge over the railway in Southchurch-avenue. The borough surveyor, Mr. A. Fidler, explained the plans.

The contract for rebuilding the Oxford wing of Welbeck Abbey, which was destroyed by fire some months since, has been let to Messrs. Froome and Co., London. About 250 men will be employed for two years.

Mr. George Addison, of Bulmer, handed in his resignation as surveyor of roads to the rural district council of Malton, Yorks, on Saturday. Mr. Addison, who is in his 81st year, joined the old Malton Highway Board as surveyor in 1871.

The Wandsworth Urban District Council have instructed Messrs. Beesley, Son, and Nichols, civil engineers, of Westminster, to prepare a scheme for the sewerage and sewage disposal of the town.

The urban district council of Hooley, Cheshire, have received a letter from the Local Government Board sanctioning the proposed loan of £1,333 for the park and recreation ground.

A new altar has been erected in Burnmore Church, as a local memorial to Queen Victoria. The design was prepared by Mr. A. Crawford Hick, whose late partner, Mr. Johnson, of Newcastle, was the architect of the church, which was built in 1805 by the late Earl and Countess of Durham. The execution was intrusted to Messrs. Percy Bacon and Brothers, of Newman-street, W., and has been carried out partly at their works in London and partly at the church. The altar is of wainscot oak throughout, gilded and decorated.

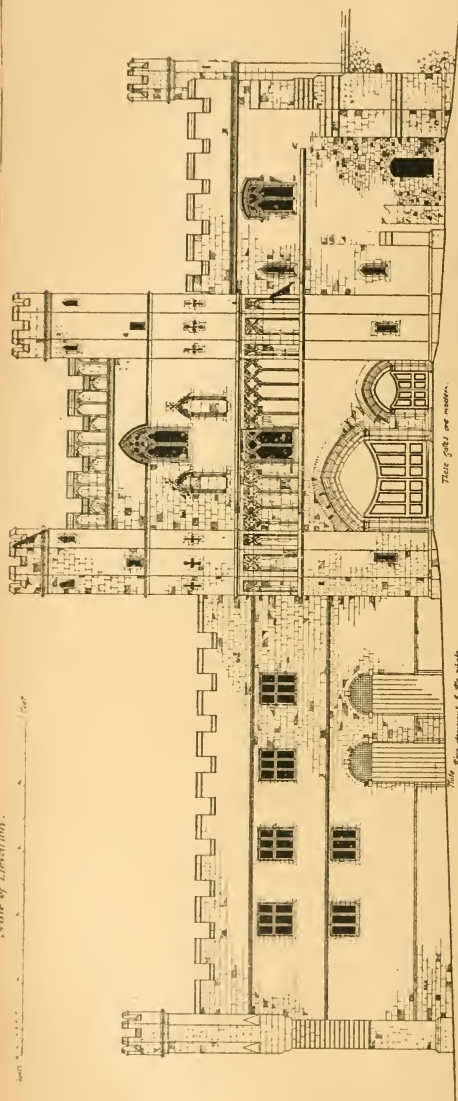
The urban district council of Sleaford have decided to complete the borrowing of £5,795 for electric-lighting purposes.

Additions are about to be made to the central fire station in Park-street, Leeds, from plans by Mr. Percy Robinson, of that city.

The Duke of Northumberland has given a sum of £4,000 and a site for the establishment at Isleworth of a secondary school for girls, corresponding with the Middlesex County School for Boys at that place.

During the past year 33 deputations from tramway committees of other boroughs or urban districts have, it has been officially reported, visited Liverpool for an inspection of the city's electric tramway system, the most recent having come from Warrington and Bolton. Probably no other local authority in the country has laid down an electric tramway in the Liverpool system was inaugurated, without first overhauling the power stations, sheds, and equipment of this city.

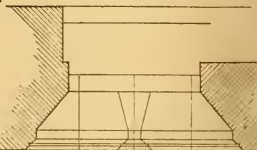
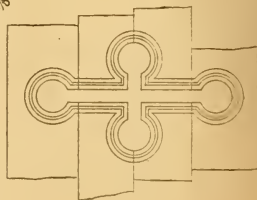
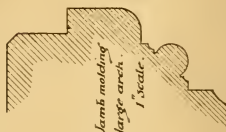
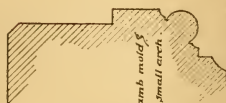
Scale of Elevation.



These gables are modern.

This area shows the site of the window and is filled up.

NORTH ELEVATION.

Loop-hole in Turret's.
 $\frac{1}{8}$ in. Scale.Jamb molding
25 large arch.
1 in. Scale.Jamb molding
15 small arch.Window of A.
 $\frac{1}{2}$ in. Scale.

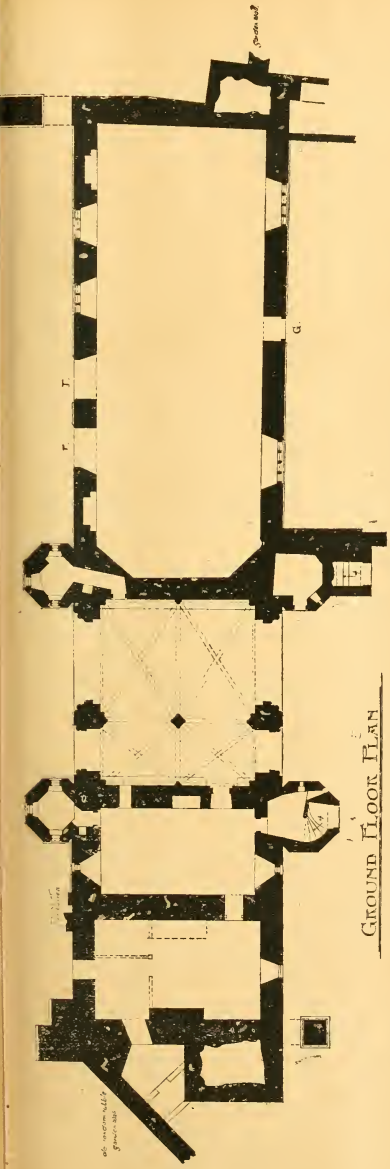
Mold of B.

 $\frac{1}{8}$ in. Scale.

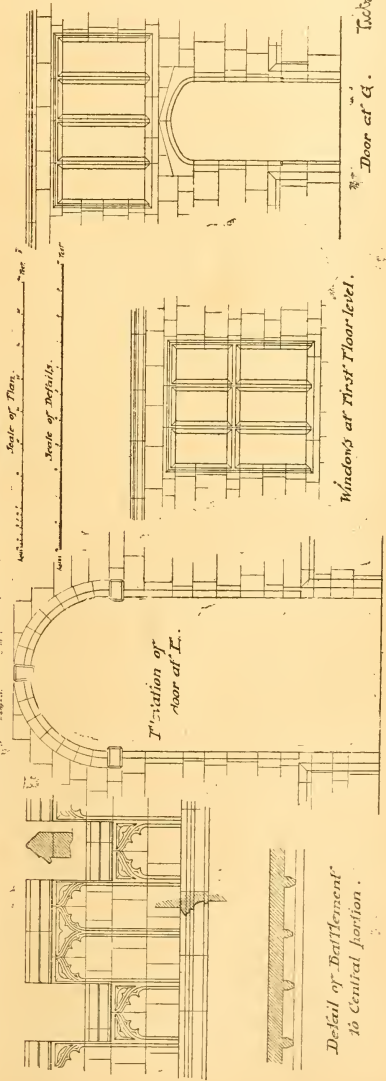
mold of C.

Turret E. Battle.
1901.

DETAILS OF BATTLE ABBEY.



GROUND FLOOR PLAN



DETAILS OF BATTLE ABBEY.

Wicks & Co. 1895.

LEGAL INTELLIGENCE.

RE CHARLES SIMMONS, LEYTONSTONE.—A first meeting of creditors was held on Monday before Mr. C. A. Pope, Assistant Official Receiver. The debtor was a speculative builder, carrying on business at Leytonstone, and it was stated that since 1889 he had built about 400 houses, obtaining the necessary funds by means of advances under building agreements. His operations had been chiefly carried on in the neighbourhood of Forest Gate, but he has also built at Thornton Heath, Barking-road, and Pinner's End. Accounts were lodged disclosing a total indebtedness of £2,779, of which £23,020 assets estimated to realise £1,074 11s. 8d., estimated surplus, £1,368 18s. The causes of failure were attributed to "deterioration of property, and failing to realise same in consequence." In answer to the Assistant Official Receiver (Mr. W. G. Williams), the bankrupt stated that up to about five years ago he was licensee of the Railway Hotel, Criccieth, which he then let on a lease. All the furniture at Llys Meirion belonged to his wife. The little furniture he had was sold for £100. May last to his daughter, in consideration of £100 which she had advanced to him. About the same time he gave a lease of Llys Meirion to his son for a term of ten years at a rent of £2,000 per annum. He admitted he was being pressed at that time by his creditors. He estimated that his property at Criccieth would yield a surplus of nearly £2,000 over and above the mortgages, but he had hitherto failed to dispose of it, although it had been offered for sale by auction. The examination was adjourned.

CHIPS.

The urban district council of Bideford have resolved to carry out forthwith a scheme of drainage and sewerage for East Bideford, in accordance with plans prepared by Mr. Baldwin Latham, C.E.

Memorial-stones were laid at Morecambe on Wednesday last in connection with the new Metho list Free Church, Sandylands. The new buildings will cost about £7,500, towards which £4,000 has been received.

The Local Government Board have issued an order confirming the Cheshire County Council order that Northwich Rural and Northwich, Winsford, and Middlewich Urban Districts shall be formed into a joint health board, and shall erect a pest-house and infectious diseases hospital. The order comes into force on September 1, and will necessitate an expenditure of some £15,000.

Works of sewage disposal are about to be carried out at Shaw Moor, to deal with 120 houses, for the rural district council of Lancashire. Mr. J. R. Lupton, of Lancaster, is the engineer.

The Local Government Board has written the corporation of Newport, Isle of Wight, sanctioning their borrowing a loan of £3,800 for the erection of a pavilion, caretaker's lodge, and making a cycle-track, &c., on the site of a disused railway. The scheme was drawn up by Messrs. Woodhouse and Willoughby, of Manchester, solicited in connection, and illustrated in the BUILDING NEWS 17 Feb. 4, 1897. The style is modernist Renaissance, the walling materials are local stone, and the outlay is about £17,000.

Lord Derby has promised to perform the opening ceremony in connection with the Barry Art Gallery and Public Library on Monday next. The building has been erected from designs by Messrs. Woodhouse and Willoughby, of Manchester, selected in competition, and illustrated in the BUILDING NEWS 17 Feb. 4, 1897. The style is modernist Renaissance, the walling materials are local stone, and the outlay is about £17,000.

New Wesleyan Sunday-schools at Over, Cheshire, were opened last week. They accommodate 250 children, are 19th-century style, and have cost £250.

Mr. Arthur Power, of Ashchurch, is the architect, and Mr. Jonathan Wilson, of Over, is the builder.

The Bermondsey Guardians, at their meeting on Friday, decided to erect cottage homes for the poor children of Bermondsey, at a cost of £10,000.

At an extraordinary Divisional Board meeting, George Alfred Norton, until recently secretary to the Harlow Local Board of Health, was recently sent to prison for three months with hard labour for embezzling a small sum of money belonging to the board. Norton, who was 47 years of age, and who had been drinking heavily, and had left a wife, he had lost his last night and his home, and had tramped all over the country, sleeping under hedges.

The parish church of Biddenden is undergoing restoration, under the supervision of Mr. J. H. Bibb, F.R.S., of Hull.

Our Office Table.

THE Board of Agriculture notify that the Ordnance Survey have completed the publication of the map of England and Wales on the scale of four inches to the inch. This is a general map of the country, and is likely to be useful to cyclists and others who require a considerable area of country on one sheet. It shows all the principal roads, railways, rivers, towns, villages, large woods, &c. The map is published in sheets of four, measuring 24 in. by 15 in. Another edition of this map is being prepared, the publication of which will shortly be completed, by counties or groups of counties, on this paper.

MR. E. A. FRY, of the British Record Society, makes a useful suggestion for rendering the Ordnance Survey more generally available for reference. The great defect is, as he points out, the total absence of any official index, save the names marked on the maps. Mr. Fry urges that there should be issued a complete list of every place, whether hamlet, village, township, ruin, Roman ruin, &c., that is mentioned in the maps, not only of the lin, but also of the 6 in. and 25 in. surveys, stating the parish and map. Any publication of a department of the State should have long ago provided this necessary adjunct, if only to attract customers.

In reference to the partial subsidence at the foundations of St. Paul's Cathedral, described in Mr. Somers Clarke's recent report, Mr. G. Johnston Stoney writes to the *Times* pointing out that water making its way along a layer of sand or gravel resting on clay, and charged with carbonic acid (and in this case probably with other solvent agencies), whereby parts of the constituents of the grains of sand and pebbles that it meets with are dissolved. Even pure water is able slowly to dissolve silicates. These chemical actions are what make the water charged with such a stratum more or less hard. The percolating water is also constantly engaged in rearranging, however slowly, the pebbles and grains of sand between which it makes its way, and it slightly washes away the surface of any clay over which it travels. It is evident that the subsidence to which these events are likely to be more in some places than in others, thus doing all the more mischief, since the water will prefer some special paths in making its way from the place where it enters the sand under the Cathedral to the place where it emerges.

Thus, Mr. Stoney suggests, "if we can prevent any water from having access to the layer of sand, the chief cause of the subsidence which has been going on will be removed. The layer of pot earth which lies over the sand, being thin, is probably not in all parts impervious to water, and surface water may reach the layer of sand through it. But the greater part of the supply probably comes from the slow horizontal travelling of water which always takes place in a nearly horizontal porous stratum which has clay or other impervious material under it. The direction in which this subterranean water flows is the part of London is probably from the north and east towards the south and west. If so, it would probably not be impossible to intercept the inflowing water, and carry it round, instead of under, the Cathedral by a deep-seated sewer to the north and east of the Cathedral. The water would then be carried under the Cathedral from surface water percolating downwards."

The report of the Historical Manuscripts Commission upon the muniments of the corporation of Berwick-on-Tweed, which is now passing through the press, will be a volume of exceptional interest. The Berwick town has preserved among its papers a large proportion of its early documents, since which go back to the reign of Edward I., while from the accession of Elizabeth its municipal records are tolerably complete. The original of the much-prized charter of Edward III. 1356 is not included in the collection, for the simple reason that it was carried off on the flight of the town to Scotland. The charter was renewed by Edward IV., and similar instruments were executed by succeeding monarchs down to the time of Elizabeth. A council-book dating from 1574 contains some curious entries, some of which are quoted in the foregoing report.

It is impossible to learn without regret that the house in which Dryden lived and wrote *Macbeth* is undergoing architectural transformation. Two statues have elapsed since the

poet breathed his last within it; and, as his name has not had the magic power of Shakespeare's, it was never such a place of pilgrimage to Englishmen that its owner attributed much importance to its possession. Accordingly it has been declared by the County Council a dangerous structure, and an order has been issued requiring it to be partly pulled down, and rebuilt, it is now the property of the County of Cambridge, whose political theories are too much in conflict with the spirit of the times to allow them to live at home at ease; but in Dryden's day it was a fashionable and literary centre, and in the building now to be destroyed the great master wrote many of his best works.

The London Boards of Guardians have in contemplated the erection of a joint or common sanatorium for the treatment of consumptive paupers on the open-air principle. There is doubt whether the poor-rates can be so applied, and to overcome this difficulty an application will be made to the Local Government Board for consent to the scheme. One, if not two, of the Boards are taking action on their own account, by increasing their infirmary accommodation, in order to introduce the open-air treatment into the ordinary medical arrangements of the workhouse. This method of procedure is perfectly legal; but what the joint boards of guardians are aiming at is the erection of a large building in the country.

ARCHÆOLOGISTS are in conflict with Dr. Carl Peters about the erection of the statue of the so-called statue of the Egyptian goddess Isis which he brought back with him from the Zambesi and the supposed land of Ophir. Dr. Peters ascribed to the statue an antiquity of at least five thousand years. Professor Flinders Petrie, however, maintains that it is not so old, opinion that it is not a statue of Isis at all. But what the statue is not determined, though Mr. Petrie offers a suggestion; nor can it be said whether it was conveyed to the Zambesi country by Egyptians or Phœnicians. Dr. Peters asserts to its age; but he does not abandon his theory that the valley of the Zambesi was peopled by Egyptians. The difference is wholesome, because it will stimulate curiosity as to the archaeology of this part of Africa which may lead to careful exploration before long.

This manager of the Bedford tramway system has submitted to the tramway committee of the corporation, a plan by which he proposes to water the main streets of the city and the suburban roads in less than a third of the time at present required by horse vehicles. The work could be done by means of a tank-car carrying 500 gal. of water, and propelled by an electric motor. Behind the tank-car would be coupled up a watering-cart having the familiar scattering equipment. A scheme by which refuse for the destructor could be conveyed along the lines by electric power is also under consideration.

ACCORDING to the annual report of the county surveyor for Kent, Mr. F. W. Ruck, of Maidstone, just issued, the maintenance of 313 roads of Kent during the year ending March 31, 1900, cost the county £52,032 19s. 6d., compared with £75,696 18s. 10d. for the previous year. The receipts totaled £2,071 6s. 7d., in contrast to £1,464 5s. 4d. for the year ending March 31, 1900, leaving a net expenditure of £79,981 12s. 11d., as against £78,231 13s. 6d. in the previous year, an increase of £5,748 18s. 5d. The cost per mile worked out at £131 5s., against £121 13s., the mileage in both years being 596m. 67. 36p.

Tur adaptability of peat for manufacture into a patent artificial wood is described by Mr. Hughes, the United States Consul-General in Vienna, in his latest report. The peat is used in the manufacture of artificial wood, the property that in moist soil it hardens steadily, owing to the formation of calcareous hydrolytic acid of alumina. It is perfectly adapted as a material for street paving, being, it is said, absolutely free from dust, noiseless, and exceedingly durable. Natural wood is not so durable, and in the opinion of Consul Hughes, do not sufficiently resist atmospheric influences, and soon warp. Peat-wood is also excellently suited for railroad sleepers. Screws, rivets, and nails become as firmly fastened therein as in the heart of oak. Wood sleepers rot in damp soil, while peat-wood remains the peat-wood harder. All kinds of wood, from willow to oak, can be excellently imitated

in this new material, which, adds the Consul, holds out, in suitable districts, fair promise of growing into a source of profitable business enterprise.

THE ARCHITECTURAL ASSOCIATION.
SEPTEMBER 16.—SIXTH SUMMER VISIT TO WARRINGTON PLANTATIONS. By kind permission of Mr. Thomas Bosc, Bart. The party will be limited by request to 25 members, who will be expected to purchase the ticket for the current season, £10, for 5s. to be sent to Mr. FRANCIS WARRINGTON, 1, Abchurch Lane, London, E.C. 4. Members to meet at the Main Lane Booking Office, Victoria Station, L.B.S. 1st, at 1.15 p.m. on the 16th inst. to Ascot, leaving at 2.15 p.m. for WARRINGTON. R. F. G. MULLER, 1, Hon. Secs.

LATEST PRICES.

IRON, &c.			Per ton.	Per ton.
Rolled-Iron Joists, Belgian	£5 0 0	to	£3 10 0	
Rolled-Iron Joists, English	6 10 0	to	6 10 0	
Wrought-Iron Girder Plates	7 10 0	to	7 10 0	
Bar Iron, good Staffs	6 10 0	to	8 10 0	
Do., Lowmoor, Fiat, Round, or Square	20 0 0	to	20 0 0	
Do., Welsh	5 10 0	to	5 10 0	
Bar Plates, Iron—				
South Staffs	10 0 0	to	10 0 0	
Best Swedish	12 0 0	to	12 0 0	
Angles 10s., Tees 20s. per ton extra.				
Builders' Hoop Iron, for building, &c., £5 15s.				
Builders' Hoop Iron, galvanised, £15 10s. 6d. per ton.				
Galvanised Corrugated Sheet Iron—				
6ft. to 8ft. long, inclusive	No. 18 to 20.	No. 22 to 24.		
gauge	Per ton.	Per ton.		
Best ditto	£11 5 0	£11 12 6		
	11 15 0	12 12 6		
Cast-Iron Columns	£8 10 0	to	£8 10 0	
Cast-Iron Stanchions	6 10 0	to	8 10 0	
Rolled-Iron Fencing Wire	8 10 0	to	8 10 0	
Rolled-Steel Fencing Wire	6 10 0	to	6 10 0	
Cast-Iron Wash Weights	8 0 0	to	8 0 0	
Cut Clasp Nails, 3in. to 6in.	9 10 0	to	9 10 0	
Cut Flat Nails	9 10 0	to	9 10 0	
Wire Nails (Points de Paris)—				
0 to 8	9 10	11 12	13 14	15
8 to 9	9 3	9 10	11 9	11 9
Cast-Iron Socket Pipes—				
3in. diameter	£3 15 0	to	£3 15 0	
6in. diameter	5 0 0	to	5 0 0	
7in. to 24in. (all sizes)	5 0 0	to	5 0 0	
[Coated with composition, 5s. 6d. per ton extra; turned and bored joints, 3s. 6d. per ton extra.]				
Pig Iron—				
Cold Chilled, Lilliehall	105s. to 102s. 6d.			
Hot Blast, ditto	65s. 0d. to 70s. 6d.			
Wrought-Iron Tubes and Fittings—Discount of Standard Lists 10s. 12s.				
Gas-Tubes	70s. p.c.			
Water-Tubes	65			
Steam-Tubes	60			
Galvanised Gas-Tubes	65			
Galvanised Water-Tubes	60			
Galvanised Steam-Tubes	55			
10wt. casks, 5wt. casks.	Per ton.	Per ton.		
Zinc, (English London mill)	£21 15 0	to	£22 15 0	
Do., Virile Montagne	20 0 0	to	20 0 0	
Sheet Lead, 3lb. per sq. ft. super.	12 5 0	to	13 10 0	
Pig Lead, in lewt. pigs	12 0 0	to	12 5 0	
Lead Shot, in 28lb. bags	15 0 0	to	15 0 0	
Copper Sheets, sheathing and rods	83 0 0	to	83 0 0	
Copper, British Cast and Ingot	71 5 0	to	71 5 0	
Tin, Cathlamet	115 0 0	to	115 0 0	
Do., English Ingots	117 0 0	to	117 10 0	
Spelter, Silesian	10 17 6	to	17 0 0	

TIMBER.			Per load.	Per ton.
Teak, Burmah	per load £10 15 0	to	£10 15 0	
" Bangkok	10 5 0	to	15 15 0	
Quebec Pine, yellow	3 17 6	to	3 17 6	
" Oak	4 2 6	to	6 15 0	
" Birch	4 7 6	to	6 10 0	
" Elm	5 10 0	to	6 5 0	
Danish and Menzel Oak	2 17 6	to	4 10 0	
Walnut, Riga p. log.	3 2 6	to	3 12 6	
Lath, Danish, p. log.	4 10 0	to	5 10 0	
St. Petersburg	4 10 0	to	5 10 0	
Ginseng	7 15 0	to	8 0 0	
Box	7 0 0	to	15 0 0	
Siam, U.S. &c. per cube foot	0 1 9	to	0 2 0	
Matagony, Cuba, per super foot	0 0 6	to	0 0 8	
Lin. thick	0 0 6	to	0 0 7	
" Honduras	0 0 4	to	0 0 4	
" Mexican	0 0 4	to	0 0 4	
" African	0 0 3 6	to	0 0 5 6	
Cedar, Cuba	0 0 3 6	to	0 0 5 6	
" Honduras	0 0 3 6	to	0 0 5 6	
Stainwood	0 0 10 0	to	0 0 1 0	
Walnut, Indian	0 0 8 0	to	0 0 8 0	
" American (logs)	0 0 2 3	to	0 0 4 6	
Deals, per St. Petersburg Standard, 123—12ft. by 11in.				
Quebec, Pine, 1st	£22 10 0	to	£23 15 6	
" 2nd	15 15 0	to	20 15 0	
" 3rd	11 5 0	to	20 15 0	
Canada Spruce, 1st	12 0 0	to	14 10 0	
" 2nd and 3rd	9 0 0	to	10 10 0	
New Brunswick	8 0 0	to	11 0 0	
Riga	8 15 0	to	9 10 0	
St. Petersburg	9 0 0	to	18 5 0	
Finland	9 0 0	to	12 5 0	
White Sea	11 0 0	to	22 5 0	
Russ. all sorts	9 0 0	to	10 10 0	
Flooring Boards, per square of 1in.—				
1st prepared	£0 11 6	to	£0 17 6	
2nd ditto	0 10 0	to	0 13 6	
Other qualities	0 5 6	to	0 12 6	
Staves, per standard M.—				
U.S. pine	£37 10 0	to	£45 0 0	
Memel, c. pine	25 0 0	to	20 0 0	
Memel, birch	190 0 0	to	200 0 0	

STONE.

Darby Dale, in blocks	per foot	£2 11	
Red Muschel ditto	"	2 11	
Hard York ditto	"	2 10	
Ditto ditto 6in. sawn both sides, randoms	per foot	sup. 0 2 8	
Ditto ditto 3in. slabs sawn two sides	"	0 2 8	
random sizes	"	0 1 3	
Hopton-Wood (Hard Red) in blocks, p. to double	"	0 2 3	
Ditto ditto 3in. ditto sawn both sides	"	0 2 3	
landings, random sizes	per foot	sup. 0 2 6	
Ditto ditto 3in. ditto ditto	"	0 1 2 1	
Portland, White Bed	per foot	cube 0 2 5	
Ditto Base Bed	"	0 2 11	
All F.O.R. London.			

OILS.

Linseed	per ton	£32 5 0	to	£32 10 0
Rapeseed, English pale	"	27 5 0	to	27 5 0
Do., brown	"	25 5 0	to	25 5 0
Cottonseed, refined	"	24 0 0	to	24 0 0
Olives, Spanish	"	24 0 0	to	24 0 0
Seal, pale	"	23 15 0	to	21 0 0
Cocunut, Cochiti	"	31 0 0	to	31 0 0
Do., Ceylon	"	29 0 0	to	29 0 0
Palm, Lagos	"	25 0 0	to	25 0 0
Olives	"	17 5 0	to	19 5 0
Lubricating U.S.	per gal.	0 7 0	to	0 8 0
Petroleum, refined	"	0 51 0	to	0 51 0
Tar, Stockholm	per barrel	1 6 0	to	1 6 0
Turpetine, American	per ton	37 0 0	to	37 0 0

It has been decided to restore the parish church of Llandfagan, near Beaumaris, and the designs of Mr. J. P. Gregory, architect, Bangor, have been accepted for the work. Mrs. R. K. Rathbone, of Glan Menai, is presenting a stained glass window as a memorial to her husband, who is interred in the churchyard.

Boleyn Castle, for some years the home of Anne Boleyn before her ill-fated marriage with Henry VIII, has been purchased for conversion into a chapel, and industrial school, and will form the religious centre of the Canning Town and Barking Roman Catholic Mission.

At Little Coats, near Grimsby, on Wednesday, Victoria, Countess of Yorkborough, opened a new road presented by Sir Walter Gilbey, owner of the Little Coats estates, henceforth to be known as the "Yorkborough-road." The road is about one and three-quarter miles in length, and has cost about £2,500. It is situated near the site of the proposed new dock, for which an Act was obtained last session, and which will be commenced at once and carried to completion in about five and a half years' time.

The Bishop of Salisbury on Sunday formally opened the Church of England Soldiers' Institute which has been erected at Bulford Camp. The £25,000 which the building has cost has been raised by public subscription, and the land, together with a plot upon which it is proposed to erect a garrison church, has been let by the War Office to the Bishop of Salisbury at a nominal rent.

A regrettable act of vandalism has occurred near Rimsbottom. The massive base of an ancient cross, which since the 12th century at least has been standing on the moor above Holcombe, has disappeared, and has just been found to have been broken into small fragments and buried in the bog. For centuries it has been known as the Pilgrim's Cross, and by that name it is mentioned in numerous documents. Early in the thirteenth century it is named in a grant of land by Roger de Montbegon, and it is named again and again, through the succeeding centuries, in similar grants.

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Trade News.

WAGES MOVEMENTS.

HULL SLATERS' STRIKE.—Some time ago a conference between the master slaters of Yorkshire and representatives of the men was held at Leeds, and a code of new working rules agreed upon, and ratified by the Hull slaters. The men now complain that the effect of Rule 8 of the new code will be to substitute labourers for skilled slaters. They object further to the reduction of a halfpenny per hour for country work. In consequence of these objections the men are now on strike. The employers have pointed out that the rule in question does not admit of such an interpretation, and further that, in view of the concessions made at the meeting in question, a reduction of a halfpenny country work was justified, Bradford having cheerfully accepted a reduction on the same lines for both home and country work.

SUNDERLAND.—A number of painters employed in redecorating Christ Church, Sunderland, struck work on Tuesday because the women were being employed to do the washing work. The contractor immediately called a meeting of the Master Painters' Association, and they agreed to support him in causing the strikers. As the strikers, they proceeded in a body, 14 strong, to the church where, in their shirt sleeves, they took up the work abandoned by the men.

At the last meeting of the town council of Ryde, the electric lighting committee reported that in connection with the scheme proposed by Messrs. Kincard, Waller, and Manville, of Westminster, and the assistance given by them in reference to the order, a claim has been received for £750, and they had after some correspondence, agreed to accept the sum of £500. The report was, after some discussion, adopted.

At a special meeting of the Kirkcubright Town Council on Monday evening, Mr. William Wilson, son of the gas manager of Coatbridge, was appointed, out of thirty-nine applicants, gas manager of the burgh, at a salary of £175, and tree house.

On Saturday afternoon the foundation-stone of a new Primitive Methodist chapel at Percy Main was formally laid by Mr. F. Leverton Harris, M.P. for Tynemouth. The building will be of red pressed bricks with white stone facings and dressings. The design will be Gothic in style, and accommodation will be provided for 400 worshippers. The cost will be about £800. Mr. George Johnson, of Westgate, Wearside, is the architect, and the contract has been let to Messrs. Davidson and Bolam, of Birtley and Blaydon.

The spire of St. Bride's, Fleet-street, 234ft. in height, which has of late shown signs of weakness, has been inspected by a steely-jack, and consequent on his report a thorough investigation of Wren's graceful spire will be made.

The men under Messrs. Thompson and Son employed on the repair of the west front of Peterborough Cathedral have now reached the highest point of their work—the bell tower, which, with its pinnacles, is surrounded by scaffolding and is being pointed. The men will afterwards work down the north side.

One new feature of the approaching horse show at Dublin will be the large building erected beside the old Horse Paddock Hall. The designs of the two structures are similar. The new hall has been erected by Messrs. Musgrave and Co., of Belfast; is about 30ft. long, 25ft. wide, and 10ft. high. It is intended to devote most of the space to accommodating carriages, but a portion of it will be reserved for thoroughbred yearlings.

The memorial to be erected by the clergy of the diocese of Manchester to the memory of the late Bishop Cranmer Roberts will take the form of a monument upon the Bishop's grave at Baldersdale. It will consist of a recumbent cross in polished red granite upon a second slab of the same material, resting upon a lining of local stone. At the head will be a bishop's mitre, and at the foot a chalice, carved in relief.

LIST OF COMPETITIONS OPEN.

[illegible]

LIST OF TENDERS OPEN.

BUILDINGS.

Hendon-cold - N. Requirs, ac., to 70, 72 and 74
Holloway-cold - Eighteen Houses
St Lynn - Two Houses
Moylle - Teacher's Residence
Wombwell - Three Houses, Hough-lane
Aston - Additions to Public Station
Ballygally - Presbyterian Lecture Hall
Perranaburrow - Classroom, ac.
Wembwell - Public Station, ac., at Nos. 36, 37, and 38
Whitley - Police Station and Petty Sessions Court
Truro - Enlarging M. Clement-street School.
Worcester - Public Station
Belmullet - Rectory
Wombwell - Six Houses
Wombwell - Public Station
Great Thurlow - House
Middlebush-cold - Asylum Extensions
Alton - Public Station
Talsary - Additions to County School
Cloniger - Twelve Houses at Walkmill
Hilly - Lecture Hall
Dunmow - Bathrooms, ac., Union Infirmary
Ballynure - Additions to House and School
Merthyr - Reading Room, Mydderion
Coventry - Residences and Stabling, Queen's-road
Wombwell - Improvements in Melin & Rockcastle Schools
Dunne - Station Building
Ballynure - Additions to House and Board School
Wombwell - Improvements in Works, ac.
Dewsbury - Three Houses, John-street
Yusland Convent - Dairy, ac.
Droghda - City of Droghda, ac.
Boston, Lines - Lockery Centre, ac., Norfolk-street
Kingsburgh, Co. Kerry - Coast-guard Station
Limerick - Art
Coventry - Residence
Bridlington - Extension of Grammar School
Loughborough - 100 Kent-road
Enfield Lock - Union Mixed School, Chertsey-road
Tulway - Alterations to Three Cottages
Walmley - Additions to Liverpool-road
Halifax - Chimney Shaft (18 ft. high), Foundry-street
Lancashire - Alterations to Parish Church
First Yarmouth - House, Wellesley-road
Grange, Leeds - City Hospital Extension
English Chalk - Methodist Chapel
Aston Manor - Fitter's Shop at Electric Lighting Station
Liverpool - Additions to Smithdown-road Workhouse
Worcester - Nurses' Home at Asylum
Carmarthen - Extensions to Shepherd's Arms
Holyhead - Additions to Houses
Nicholas - Public Station
Bristol - Alterations to Royal Infirmary
Conkey - Organ Chamber, ac., at Congregational Chapel
Barking - Building of Electricity Station
Old Preshaw - Seven Houses
Great Yarmouth - House, West-road
Burgess - Public Station
Great Harwood - U.M.F.C. School, Windsor-road
Barnsley - School, one ac.
Aldershot - Public Station
Pittsburgh - Public Washhouses, Allan-street
Preston - Chimney Shaft 100 ft. high, Royal Infirmary
Southport - Cemetery, Broomfield and Cottage
St. Albans - Court-House Lavatory
Aberdeen - Swimming-Baths at Public Park
Swansea - Two Vestries in Wesleyan Chapel
Trenton - Improvements at High Bridge
Bristol - Stable, Lawrence-hill
Wimborne - Movable Floor to Swimming Bath
Kirkcaldy - Public Station, Bridge
Kirkcaldy - Coast-guard Station
Lower Slenham - Cottage at Home Park upon Ayrton
Preston - Public Station, Additions to County Asylum
Langho - House for Inebriates
Brixham - Thirty Four-Roomed Artisans' Dwellings, Dower-st.
Brixham - Public Station, Melrose-street Depot
Llanelli - School at Tyneas
Lincoln - Boiler-shop, ac.
Poultney - Building Farm Premises
Patterdale - Police Station
Poultney - Landwehr School, six places
Paddington, W. - Ministry Buildings and Chapel
Dewsbury - 178 Cottages and 22 Villas
Barnsley - Two - Public Station Buildings
Grays Inn-road, W.C. - Casual Wards
Swansea - Harbour Offices
Kilmarnock - Tobacco House, Hotel
Ashford, Kent - Additions to Beaver-creek Board Schools
New Public Offices, ac.
Bury Port - Public Station
West Derbyham - Church Extension
Lancashire - Crossings - Classroom, ac.
South Queensferry - Additional Buildings to Police Station
Kirkton-in-Lanark - Enlargement of Boys' School
Sydenham - Block of Flats
Windsor - Public Station, Eighty-eight Workmen's Cottages
Blackridge - Additional Buildings to Police Station
Kirkton - Alterations to Public Station
Wilton-in-Wear - Laundry

Metropolitan Asylums Board
B. Hewson
Thomas Hargate
Aberdeen County Council
Metropolitan Asylums Board
Bible Christian Chapel Trustees
Anthony Gibbs
Arthur Easby
Greenfield Building Club
Asylum Visiting Committee
Alton, Berks - Victoria-street, Victoria-street
Glamorgan County Council
Congregational Church Trustees
Guardians
Urban District Council
Hewitt and Hibell
Calcuttina Railway Co.
Corporation
Joseph Coates
Brynhyfod Building Club
School Board
Committee
Col. Sir Edward S. Hill, K.C.B.
St. Mary-le-Strand Charity Trustees
Enfield School Board
Urban District Council
Tramways and Electricity Committee
H. B. Atkins
Sanitary Committee
Urban District Council
Tuxford Park Guardians
E. Evans Bevan
Nicholas, Saul
Urban District Council
Corporation
Urban District Council
Hertfordshire County Council
Urban District Council
Lancashire County Council
Great Western Railway Co.
Urban District Council
Lancashire County Council
Lewisham Borough Council
Public Health Committee
Lancashire Inebriate Asylum Board
Town Council
Urban District Council
School Board
Miss South
School Board
Borough Council
Carmarthen Building Club Trustees
Guardians
Halifax Union Guardians
Harbort Trustees
School Board
Urban District Council
Pembrey School Board
Governors
North Devon County Committee
School Board
Oakbank (Co. Co. Ltd.)
Standing Joint Committee
Edwin Hetherington
T. Duncombe Mann, Clerk, Embankment, E.C.
The Shotton Colliery Offices, Castle Eden
T. Wilson, Architect, River-street, King's Lynn
M. A. Robinson, M.R.I.A.I., Richmond-street, Londonberry
John Robinson, Architect, Wombwell
A. M. Price, Architect, Aberdare
The Rev. Wm. Dickson, Helen's Bay, Ireland
Wm. Mitchell, Clerk, Penarth-park
Duncombe Mann, Clerk, Embankment, E.C.
J. Creswell, County Architect, Moolah, Newcastle-on-Tyne
Edward Board, The Cemetery, Southwell's Hill, Truro
John Robinson, Architect, Wombwell
Lieut. A. C. H. Pearson, R.N., Logstown, Belmullet
John Robinson, Architect, Wombwell
The Secretary
A. J. Simpson, A.M.I.C.E., Haverrill, Suffolk
A. J. Wood, Architect, 22, Surrey-street, Embankment, W.C. Sept.
B. Berry, Architect, 10, Berry-street, Huddersfield
W. W. Williams, Archt., 63, Island Chambers Wind-st., Swansea
J. M. Mitchell, 10, Tolmound, Glasgow
Alvin and Hill, Architects, Prudential Buildings, Bradford
Richard Reed, F.R.I.B.A., 11, Fishburn-circus, E.C.
James M. Kenzie, Clerk, Kilmichael
The Surveyor, Town Hall, Merthyr
Harrison and Hatfield, Architects, 28, Hertford-street, Coventry
The Rev. Daniel O'Connell, 10, Victoria-street, W.C. Sept.
The Company's Engineer, Buchanan-street Station, Glasgow
James M. Kenzie, Clerk, Kilmichael
J. F. Colquhoun, A.M.I.C.E., 64, Cockburn-st., Glasgow
Frederick W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury
J. C. Hamilton, Armcliffe, Armcliffe, via Carlisle
W. Dowdswell, 10, Victoria-street, W.C. Sept.
J. Rowell, Architect, Market-place, Boston, Lines
The Office of Public Works, Dublin
Bedford and Kingston, Architects, Great-street Chambers, Leeds
Geo. E. Halliday, F.R.I.B.A., Architect, Cardiff
Botterell, Son, and Bilson, Architects, 23, Parliament-street, Hull
H. Cole, Surveyor, 10, Victoria-street, W.C. Sept.
G. E. T. Laurence, Architect, 22, Buckingham-st., Adolphi, W.C.
J. D. Jones, J. Linsley-engineer, Talwyn
M. A. Wilson, Surveyor, Walmley
James Lord, C.E., Borough Engineer, Town Hall, Halifax
Borlham and Mortimer, Architects, 23, St. James-st., York
J. G. Baker, Architect, Town Hall Chambers, Great Yarmouth
The City Engineer, Municipal Buildings, Leeds
Dr. J. L. Thomas, 10, Victoria-street, W.C. Sept.
Reginald P. Wilson, C.E., Aston Manor
Walter W. Thomas, Architects, 15, Lord-street, Liverpool
David Smart, Architects, 10, Victoria-street, W.C. Sept.
J. Cook Bees, Architect, Neath
J. Owen, Architect, Menai Bridge
John Kissell, M.P., Kirby Lonsdale
A. P. I. Cottrell, 28, Baldwin-street, Bristol
C. Morgan, Wylfa House, Johnstown, Burton
F. T. Jackson, Surveyor, Public Offices, Barking
R. W. Wilson, Westbourne House, Shiney-row, Durham
Sydney Rivett, M.S.A., Architect, 5, South Quay, Great Yarmouth
G. M. Moonland, A.M.I.C.E., Surveyor, R.E.
W. H. Dinley, Architect, Cleveland-street, Chorley
Thomas Lamour, Hon. Sec., Dromore-street, Banbridge
F. T. Jackson, Surveyor, Public Offices, Barking
Robert Morham, City Architect, Edinburgh
F. E. Dixon, C.E., Architect, 49, Lansdowne, Epsom
William Harrison, Architect, 187, Leamington-road, Southborough
Urban A. Smith, County Surveyor, 41, Parliament-street, S.W.
The Surveyor, Town Hall, Aberdare
E. T. Emswiler, Clerk
The County Bridgmaster's Office, Preston
J. M. Kenzie, Clerk, Kilmichael, Public Offices, Lincoln
G. K. Mills, Secretary, Paddington Station
H. H. Thompson, A.R.I.B.A., 47, Hill-road, Wimbleson
The County Engineer, 10, Victoria-street, W.C. Sept.
A. Ferguson, Insurance Buildings, Dorend-street, West, Belfast
The Surveyor, Town Hall, Cardiff
M. A. Thomas, A.M.I.C.E., County Engineer, County Hall, Aylesbury
Henry Little, Council Architect, Council Offices, Preston
J. F. C. May, M.I.C.E., Borough Engineer, Town Hall, Brighton
The Surveyor, Town Hall, Merthyr
J. Davies and Son, M.S.A., Cowell House, Llanelli
Ruston, Proctor, and Co., Steel Ironworks, Lincoln
F. T. Jackson, Surveyor, Public Offices, Barking
Joseph Bantley, County Surveyor, 1, Lower-street, Kendal
Wallace and Westwick, Architects, Middlesbrough
The Surveyor's Dept., 10, Victoria-street, W.C. Sept.
W. Dowdswell, Architect, John-street, Falmouth
W. Mitchell and Sons, Architects, 10, Victoria-street, Birmingham
B. Williams, Medical Officer, 37, Buckingham-street, W.C.
Talford Street, Clerk, Harbour Offices, Swansea
John Sim, Architect, 10, Victoria-street, W.C. Sept.
Jeffery and Lacey, Architects, Ashford, Kent
Heston, Ralph and Heston, Architects, Wigan
Richard Williams, Architect, Wigan
Herbert Green, Architect, Norwich
H. J. Francis, Architect, Abernethy
H. B. Henderson, Surveyor, 10, Victoria-street, W.C. Sept.
P. Palmer, Clerk, Kirkton-in-Lansley, Lincoln
F. C. Davies, Archt., Estate Office, Rosendale-road, Heme Hill, S.E.
The Secretary, 10, Victoria-street, W.C. Sept.
F. G. H. Henderson, W.S., Llanthony
John Hutton, Architect, Kendal
Barnham Wilkington, Clerk, near Chester-le-Street

BUILDINGS—continued.

Barnon-Cottage	Mrs. Irvine	Garlick and Flint, Architects, Buxton
Tredmen—Classroom, &c.		F. Hoam Shaplay, Architect, 19, Church-street, Oswestry
Wiggin—Stables for Forty Horses	Equitable Co-operative Society	J. B. & W. Thornley, Architects, Powell's Chambers, Millgate, Wigton
Hoole—Additions to All Saints' Schools.		John H. Davies and Sons, Architects, Newgate-street, Chester
Towarth—Farmhouse	R. Duncombe Shafto	Stevens Wilkinson, Architect, Pelton, near Chester-le-Street
Wilecote—Shops and Fifteen Two-Story Flats		J. Morris, 23, London-street, Newcastle-on-Tyne
Beggar—Vale		R. and E. E. Pearson, Architects, 27, Castle-street, Edinburgh

ELECTRICAL PLANT.

Doncaster—Tramway Switchboard	Corporation	C. A. I. Prusman, Boru' Elec. Eng. Greyfriars-road, Doncaster	Aug 31
Amsterdam—Electrical Tramcars, &c.	Municipality	The Director, Municipal Tramways, Nieuwe Achtergracht, No. 164, Amsterdam	Sept. 2
Rotherham—Compound Engine and Dynamo	Corporation	H. Hampton Copnell, Town Clerk, Town Hall, Rotherham	3
Aston—Electric Lighting Plant	Urban District Council	Reginald P. Wilson, Consulting Engineer, Aston Manor	4
South-end-on-Sea—Electric Lighting Cables	Corporation	D. F. Adamson, M.I.E.E., Boru' Elec. Eng. Southend-on-Sea	7
Dover—Electric Lighting Plant	Mayor and Corporation	W. H. Wainwright, Esq., Dover	7
Edinburgh—Electric Light Installation at Fever Hospital	Lord Provost and Magistrates	The Resident Electric Engineer, Dewar-place, Edinburgh	7
Oldham—Two Electric Overhead Travelling-Cranes	Corporation	Dr. Alex. B. W. Kennedy, I.T.E., Victoria-street, S.W.	10
Enniscorthy—Electric Lighting Committee	Enniscorthy Electric Lighting Committee	E. Storey, Borough Engineer, Corporation Works, Torquay	13
Kirkcaldy—Overhead Construction for Electric Tramways	Corporation	Kennedy and Jenkin, I.T.E., Victoria-street, Westminster, S.W.	13
Leighborough Junction, S.E.—Continuous-Current Plant, &c.	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	Oct. 8
Overseer of Electric Lifts, &c.	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	8
Withington—Telephones	Urban District Council	A. H. Mountain, A.M.I.C.E., Town Hall, Withington	—

ENGINEERING.

[illegible]

FENCING AND WALLS

Poston-Iron Fencing, Clay Dyke Bridge	Holland County Council	L. Starkie, District Surveyor, Boston, Lincolnshire	Aug. 31.
Darlington-Stone Retaining Wall and Palisading	Streets Committee	The Borough Surveyor, Town Hall, Darlington	Sept. 2.
Horlstone-Boundary Wall & W.I. Railings at Children's Home	Great Yarmouth Guardians	Arthur S. Hewitt, Architect, 23, Regent-street, Great Yarmouth	" 2.
Ureton-River Wall	Urban District Council	J. S. Pickering, Engineer, Council Offices, Uxneton	" 2.
Hackney-N.E.-Concrete Walling, Regent's Canal	Urban District Council	Norman George, Engineer, Town Hall, Hackney	" 2.
Aberdeen-Wrought-Iron Unclimbable Fence (700 lin. yards)	Urban District Council	The Surveyor, Town Hall, Aberdeen	" 9.
Manchester-Retaining Walls	Corporation	The City Surveyor, Town Hall, Manchester	" 9.
Buckingham-W.I. Railings	Urban District Council	F. Dawson, Surveyor, Public Offices, Barking, Essex	" 11.
Gosport-W.I. Unclimbable Railings (250 yards of iron post-and-rail)	Gosport and Alverstoke T.D.C.	H. Frost, Surveyor, Town Hall, Gosport	" 11.
Worcester-Wrought-Iron Fencing (70 ft.)		A. Oddy, Borough Surveyor, Pontefract	" 11.

FURNITURE AND FITTINGS

Prizes—One Hundred "Lawson Tail" Bedreads	Guardians	J. F. Winttingham, Clerk, St. Mary's Church, Great Grimsby	Aug. 31
Roomy—E. Passmore Edwards Library, Roman-road	Popular Public Libraries Committee	Edmund Potts, Town Clerk, Grimsby	Sept. 2
Lawford—Gallery Fittings to Parish Church		Borham and Morton, Surveyors, 24, John-street, Sunderland	" 4
Darford—Kitchen Fittings, Joyce Green Hospital	Metropolitan Asylums Board	A. and C. Harston, Architects, 13, Leadenhall-street, E.C.	" 23

PAINTING.

St. Andrew's Church, Hants	Exterior of Workhouse	Guardians	J. Druitt, Clerk, Christchurch, Hants	Aug. 31
Swansea Police Station		Abereiddy County Council	M. P. Price, Architect, 223, Union-street, Abereiddy	Sept. 1
Swansea—Three Houses		J. Cates	W. B. A. B. A. Borough Chambers, Dewsbury	1
T. Donnell's—Cath. Dwelget Chapel			W. Selby, Cross House, Cardigan	2
T. Donnell's—House and Shop			James M. Kenzie, Glace, Kirkcaldy	2
Waspw—Refuge Despatch Work			D. M. Coll, Surgt. Cleveleys, Ch. Cochrane-street, Glasgow	2
Waspw—Twelve Houses at Walkmill			J. C. Hamilton, Arncliffe, Arz.	2
Waspw—County Dairy			H. Mitchell, Architect, Strand, Teddington	2
Waspw—School Board Offices			J. C. Hamilton, Arncliffe, Arz.	2
Waspw—Workhouse		School Board	Jno. O'Donoghue, Clerk, Albion-street, Hull	2
Waspw—Public Washhouses, Allan-street		Midway Union Guardians	The Master's Office, Workhouse, Chatham	2
Waspw—Workhouse		Corporation	Corporation City of Glasgow	2
Waspw—Catharine School Chapel, Richmond-street		Guardians	A. W. Carver, Clerk, Union Offices, Canmore	2
			W. A. Abbot, Clerk, Dublin	2

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Hamdunbury—Fifteen Houses	J. Bony, Architect, 9, Queen-street, Tudl. Hensfield	Sept. 2
ROADS AND STREETS.		
Halifax—New Streets	Gso. Buckley and Son, Architects, Tower Chambers, Halifax	Aug. 31
Kakenfield—Private Street Works	The City Surveyor, Town Hall, Wakefield	Sept. 31
Arner—Road Works	S. M. Wallace, Acting Clerk, Larne	Sept. 2
Arfield—Concrete Pavement	Charles Dawson, Clerk, Public Hall Chambers, Lckfield	" 3
Old Hall—Making-up Noggins in Hill	Rowley Regis Urban District Council	" 3
Lidlington—Paving Amy Street	Daniel Wright, Clerk, Old Hall, Staffordshire	" 4
Loon-on-Sea—Tar-laying 2,024 yards Chapman-road	W. Selburn, Estate Surveyor, Town Hall, Middleton	" 4
	Urban District Council	" 4
	A. B. Robinson, Surveyor, Town Hall, Clacton-on-Sea	" 4

C. H. Dodd, Town Hall, Ilave	Sept. 4
C. Day, Borough Surveyor, Chatham	" 5
The Borough Engineer's Office, Town Hall, Sunderland	" 6
Joseph Slater, County Architect, Street-2, The Polygon, Eccles	" 7
Arthur Marshall, District, King-street, Nottingham	" 9
Henry Entwistle, Surveyor, Council Offices, Swinton	" 10
F. E. Dawson, Surveyor, Public Buildings, Chelmsford	" 11
C. C. Pease, Borough Engineer, Town Hall, Fodmorden	" 12
H. Glynn Waine, Surveyor, Avenue Chambers, Chelmsford	" 13
J. B. Wilson, A.M.I.C.E., Court Builders, Cockermouth	" 14
W. Brown, Surveyor, Mill, Ambleside, Ambleside	" 15
The Borough Road Surveyor's Office, Town Hall, Croydon	" 17
Charles A. Harrison, Central Station, Newcastle-on-Tyne	" 18

W. L. Douglass, C.E., 13 Clyde-street, Hamilton	Sept. 2
W. Johnson, Esq., 10, St. George-street, Edinburgh	" 2
W. A. Buid Leung, C.E., 13, George-street, Edinburgh	" 2
W. Vaux Graham, M.I.C.E., Queen Anne's Gate, S.W.	" 2
William Dodds, Surveyor, 1, St. George-street, Edinburgh	" 2
The City Engineer's Office, Municipal Buildings, Leeds	" 2
George T. Lynam, Borough Engineer, Burton-upon-Trent	" 2
Holmon and Co. Architects, Corporation-street, Dewsbury	" 2
W. H. Smith, Esq., 10, St. George-street, Edinburgh	" 2
T. F. Holmes Watkins, Clerk, Ch. Chambers, Pontypool	" 2
A. J. Price, Engineer, Lytham	" 2
C. F. Dawson, Surveyor, Public Offices, Barking, Essex	" 2
Ed. Caley, Ch. Barkeby Union, Homerton, N.E.	" 2
W. Barlow Morgan, Borough Engineer, East-street, Weymouth	" 13
The Surveyor, Town Hall, Cardiff	" 13
W. Keywood, Esq., Ch. Chambers, Maldon	" 13
The Engineer's Department, County Hall, Spring Gardens, N.W.	Oct. 2

D. McCall, Supd., Cleansing, 64, Colchester-street, Glasgow	Sept
The Director, Municipal Tramways, Wierstrasse Achte-gericht, No. 164, Mannheim	10
The Receiver-General and Director of Contracts, Valletta	11
James M. Gale, Water Engineer, 45, John-street, Glasgow	11
F. W. Lacey, M.I.C.E., 'Buro' Eng., Man. Offices, Bournemouth	11
The Chief Engineer, Donington House, Norfolk-street, W.C.	2
Harold Barker, Eng. Engineer, Town Hall, Exeter	2
London Port, Dock, and Wharf, Silica, London	2
The Engineer's Department, County Hall, Spring Gardens, S.W.	04.
The Engineer's Department, County Hall, Spring Gardens, S.W.	04.
J. Featherby, Engineer, Bishops Stortford, Herts	—

[illegible]

roof, and pitch-pine dado and seats. The building will be of red brick with stone facings and will have a spire. Mr. W. Ingram, of Cannock, is the builder and the estimated cost is £3,000.

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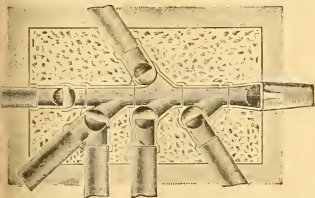
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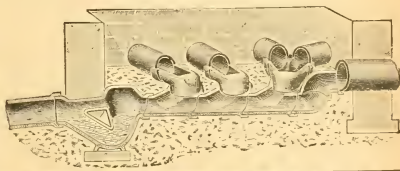
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TENDERS.

* * * Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

ABERDEEN.—For the construction of a sewage tunnel conduit beneath the river, for the corporation:
Taxes, F. Aberdeen (accepted) £1,000 8 2

ASTON ABBOTS, BRICKS.—For the erection of a pair of cottages, for Mr. Edward Hart, Mr. Fred Taylor, A.R.I.B.A., Aylesbury, architect:
Cannon, T. J. N. £500 0 0

BERKELEY.—For the erection of a detached residence in the Wendover-road, for Mr. J. Kitchin, Mr. Fred Taylor, A.R.I.B.A., Aylesbury, architect:
Webster and Cannon £282 0 0
Green, W. Y., and Co. 820 0 0
Holland, J. 801 0 0
Maynard and Son* 783 0 0
* Accepted, subject to variations.

BERKES.—For building infant schools, for the school board:
Grinwood and Sons, Ipswich £3,107 10 0
Accepted.

BIRLEY.—For constructing a sewer under the canal at Muckledale, for the urban district council:
Buckley, H. E. (accepted).

BULL.—For additions to the National Schools at Oakley, for the Bull School Managers, Mr. Fred Taylor, A.R.I.B.A., Aylesbury, architect:
Holland, J. £227 0 0

CHURCHLEY, BRICKS.—For additions to house at Churchley, for Mr. F. T. Higgins, Bernard, J.P., Mr. Fred Taylor, A.R.I.B.A., Aylesbury, architect. Quantities supplied by the architect:
Kinglester, T. H., and Sons £2,029 0 0
Gibson, G. H. 1,850 0 0
Webster and Cannon 1,725 0 0
Green, W. Y., and Co. (accepted) 1,652 10 0

DUFFIELD.—For supplying and erecting gasholder and tank and connecting mains, for the urban district council.
Mr. Tebey, engineer:
Walker, C. and W. Ltd., Donnington, Salop, accepted £3,380 0 0

EAST COWES.—For laying a water-main in York-avenue, for the urban district council:
Bradford and Co. £141 0 0
Fish, R. amended 131 0 0
Deacon (accepted) 132 12 0

FOVEY.—For erecting a mortuary at Fovey, for the rural district council of St. Austell:
Mitchell, E. H., Tynariceth Accepted. £81 0 0

GIBRALTAR.—For the completion of the dockyard extension, for the Government:
Thames Ironworks Co., London accepted.

HORNCASTLE.—For the rebuilding of a bridge at Poolham, for the Horncastle Rural Sanitary Authority:
Hurley, Joshua, Kirby-on-Bain (accepted).

HUNTSWOOD.—For building and covering shed to a new gas purifier, for the urban district council:
Southgate, F. (accepted) £133 10 0
Lowest of five tenders—highest £135.

KECHIN, DEVONPORT.—For the completion of the Royal Dockyard extensions at Kechin:
Thames Ironworks Co., London (accepted).

KINGSTAY, S.R.—For the erection of the new lunatic asylum, for the county council of Aberdeenshire. Accepted tenders:—

Robertson, A. B.	Plumber:—	£6,748 0 0
Adam, A., and Co.	Slater work:—	2,023 11 8
Grant, J., Gileonist Works	Iron and steel:—	1,151 0 0

LONDON.—For alterations and additions at No. 101, Great Titchfield-street, W., for Mr. William Matthews, Messrs. H. Fuller-Clark and Percy A. Boulting, 23, John-street, Bedford-row, W.C., architects:—

Patman and Fotheringham	£3,700 0 0
Clark and Mannock	2,497 0 0
Hughes, J.	2,408 0 0
Perkins, H. M., and Co.	2,395 0 0
Sunderland, E. J., and Co.	2,383 0 0
Webster, A. A.	2,253 0 0
Burnham, H., and Sons	2,045 0 0
Anley, J., and Son	1,920 0 0
Pitcher, J. D., and Son (accepted)	1,904 0 0

LONDON.—For alterations and additions to the work-house, Fulham Palace-road, Hammersmith, W., for the guardians of the Fulham parish:—

Clifton, H. C., Baywater	£1,210 0 0
Martin, Wells, and Co., Vauxhall	3,691 0 0
Minter, F. G., Westminster	3,041 0 0
Bendon, T., Hammersmith	2,921 0 0

LONDON.—For repointing, painting, and general repairs to Nos. 101-2, Chalfont-street, for Messrs. Connolly Bros., Mr. Edwin G. Salter, 15, Phoenix-street, St. Paulins, N.W., architect and surveyor:—

Sharphington, T. G., Nunhead	£320 0 0
Marshall and Hark, Highgate	408 0 0
Fowler Bros., Duke's-road	487 10 0
Dove, H. M., Euston-road	450 0 0
Clarke, W. J., Kentish Town	228 0 0
Years, J., and Co., Paddington	419 0 0
Hunnings, W., Holloway (accepted)	515 0 0

LONDON.—For masonry works at 19 and 11, Percy-street, W., for Messrs. Geo. Rowney and Co., Mr. Walter Elphinstone, F.R.I.B.A., Savoy House, 115, Strand, W., architect:

Sandland, R.	£258 0 0
Raymond, J. J., and Sons	237 18 0
Oliver and Son	237 13 0

LONDON.—For painting, whitewashing, and repai &c., at the workhouse and infirmary, Fulham Palace-road, Hammersmith, W., for the guardians of the poor Fulham parish:—

Halse, J., Fulham	£1,643 0 0
Henshaw, W. J., Putney	1,459 0 0
London, T., Hammersmith	1,407 0 0
Vigor and Co., Poplar	853 0 0
Richards, J. J., Brighton	714 0 0
McArthur, G., Fulham (accepted)	760 0 0
Mills, E., Westcombe Park	743 0 0

LONDON.—For alterations at No. 53, Berners-street, Messrs. H. Fuller-Clark and Percy A. Boulting, 23, John-street, Bedford-row, W.C., architects:

Bruton, F. T., and Son	£145 0 0
Boulting, T. J., and Sons	393 0 0
Anley, J., and Son	310 0 0
Pitcher, J. D., and Son	291 0 0

LONDON.—For works of painting, &c., at various buildings, for the London School Board:—

Glyn-road School—Painting interior:—	
Silk, W., and Son	£167 0 0
McCormick and Sons	161 0 0
Crawley, T.	150 10 0
Willmott, C.	141 0 0
Barker, G.	111 0 0
Barker, G. (accepted)	139 0 0
Manoford-street School—Painting exterior J. M. Schuch	
Holliday, J. F.	£170 10 0
Stevens Bros.	165 0 0
Willmott, C.	164 0 0
Corfield and Co.	139 0 0
Haydon, J. (accepted)	116 0 0

Upton House School—Painting exterior
Deering, C. and Son £222 0 0
Barker, G. 198 0 0
Crawley, T. 183 0 0
Silk, W., and Son 170 0 0
Barker, G. 165 0 0
Wales, G. (accepted) 113 0 0

Credon-road School—Painting exterior:—
Lime, H. £220 0 0
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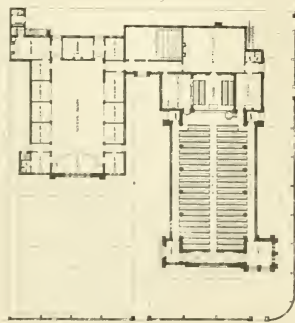
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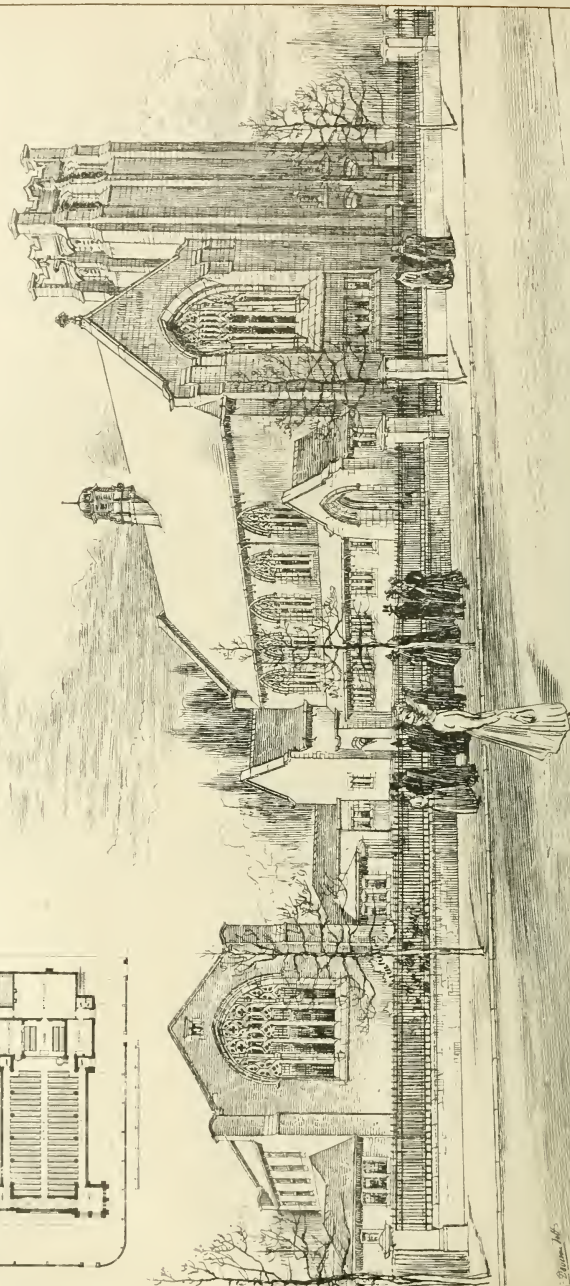
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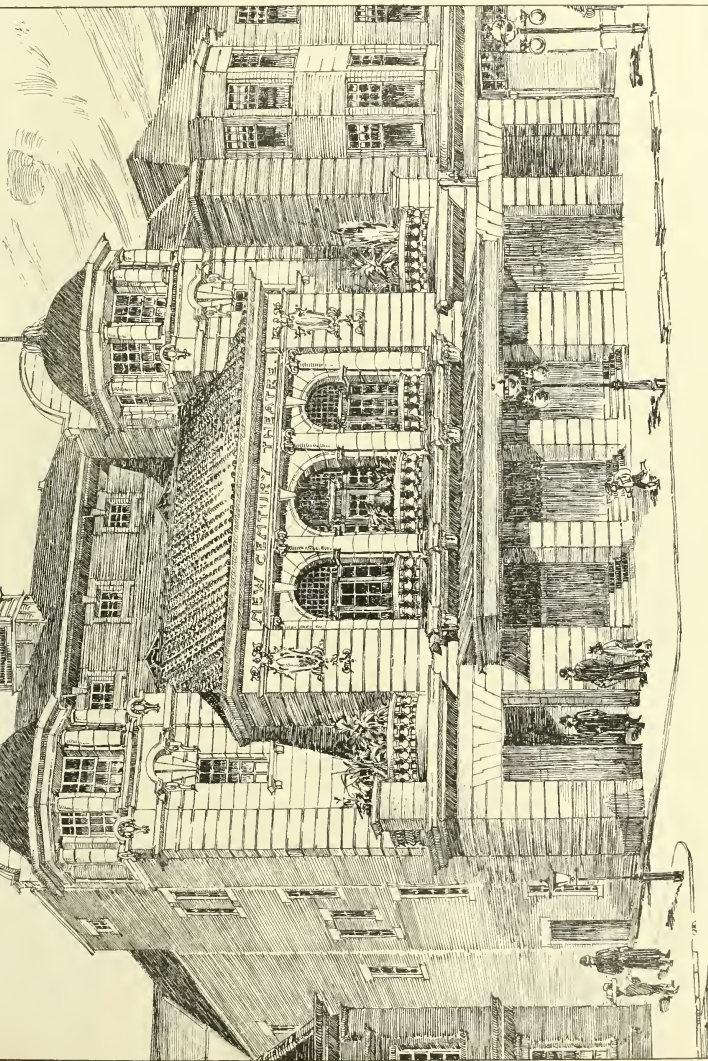
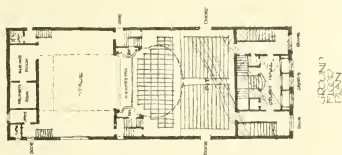
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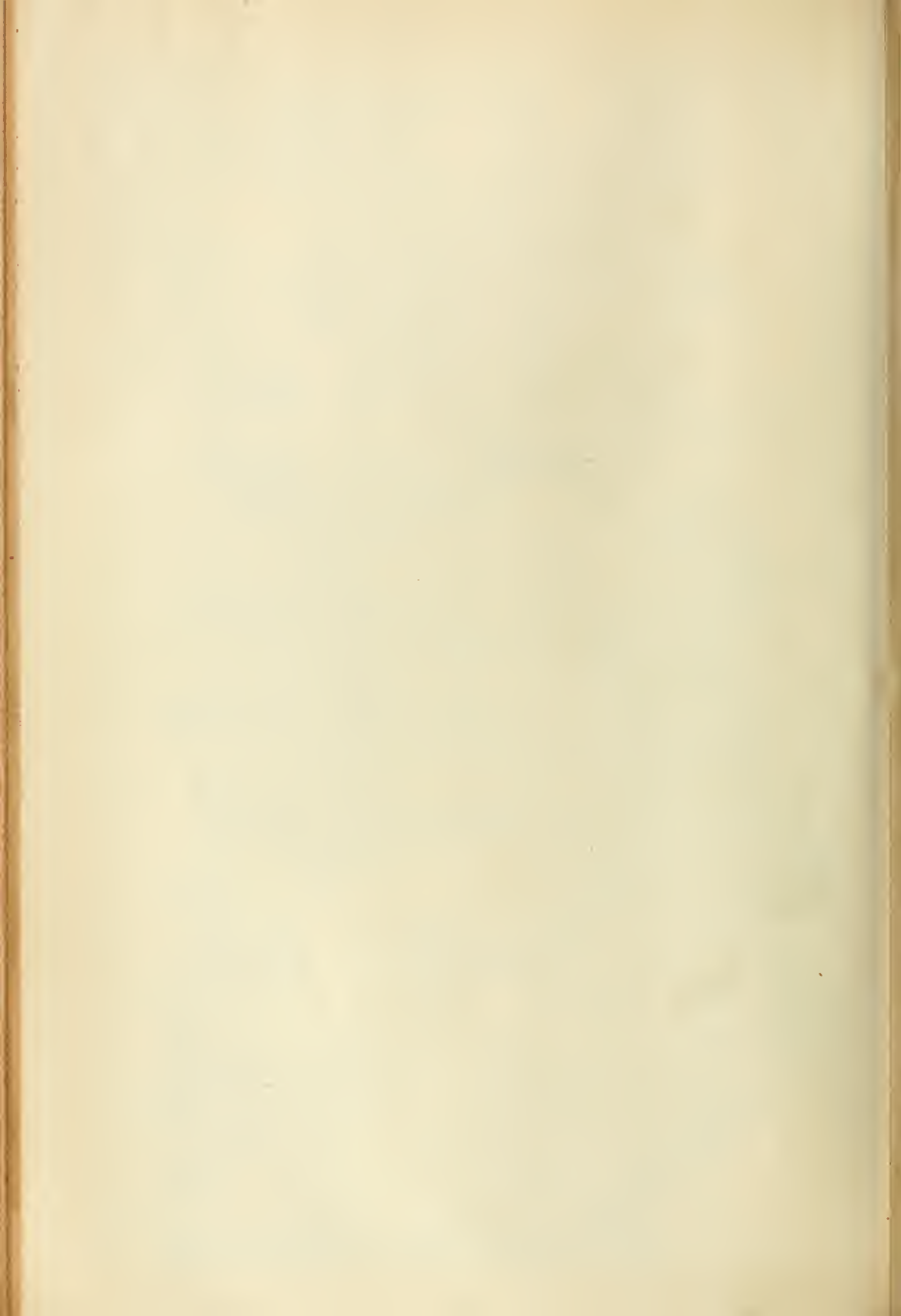
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THE BUILDING NEWS

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VOL. LXXXI.—No. 2435.

FRIDAY, SEPTEMBER 6, 1901.

THE ARCHITECT'S PUPIL: HIS RELATION TO SCHOOL AND OFFICE.

LATELY the position of the architect's pupil has received considerable attention at the hands of educationists and the profession, but not more than the question deserves, seeing that the architecture of the present century will much depend on the solution of the educational problem that is before us. If the future architect is to become the product of the great educational machine that is now being put in operation by those entrusted with his training, in which courses of lectures and examination papers will be the chief agencies employed, it is reasonable for the profession to become acquainted with the fact, so that any enthusiasm for art, who believes in his capacity to follow the footsteps of leaders of the art, may not be disappointed in the course that lies before him. It may be as well that his mind may be disabused of the idea that his leftness in drawing and design will be sufficient to assure him of an achieved position in the profession. More than ever before, the factor of education will become prominent, by which we mean not only a general knowledge of the principles of engineering and surveying. The student who has gone through a university training will have the start of one who has been pursuing the rather tortuous method of picking up his knowledge during his office career, of course presuming they are both equal in other qualities. Eminent architects of the past generation achieved their success by the very force of their architectural talent, at a period when their attainments were at a low ebb, or not considered essential, not in spite of them. The conditions of the profession have so far changed that instead of talent in drawing being considered the preparation and basis of the architect's work, construction in various materials, knowledge of special types of building, of general scientific applications have become essential qualifications. The fact is, the groundwork of the profession has been enlarged. What was thought sufficient half a century ago is quite inadequate in these days of school boards and technical education. The ground itself has somewhat changed. The building problem has come to the front, and has to some extent pushed aside the architectural and ideal. It is now a question of construction, with its means, of the use of iron and many new materials, of accommodating so many people or inmates, of providing beds for certain patients, schools for technical instruction, baths and wash-houses, and the like. Not that the artist is of less value than the expert constructor, but that his art has extended to new applications of which he knows little and cares less. The subject has been discussed both in this country and in America, and we now refer to the controversy at the late Convention of the Architectural League. The Committee on Education proposed a series of questions, each of them being assigned to architectural clubs, and the answers given by several members of papers fairly represent the professional opinion on the several points. The first question was: "What should be expected of a graduate from an architectural school when he begins office work?" The paper read by Mr. C. Howard Walker, who opened the discussion, gives a practical answer to the

question. He observes that the training they receive as draughtsmen in a school is only an incidental part, and therefore the most important part of a graduate's attainments is not called for till a considerable time after he has entered an office. When the student enters the office his duties are slight: he is expected to draw well and neatly, to have a knowledge of scales, of combining materials, to be proficient in construction, in making diagrams of stress, in ability to use formulas, to be conversant with the Styles of architecture. Mr. Brueggemann, of St. Louis Architectural Club, discusses both this question with the next: "What should the schools leave for the offices to teach?" It is truly said we cannot expect from a graduate any more than from any other person what he has not been taught. Courses in architectural schools cannot be expected to be comprehensive enough to turn out graduates proficient in drawing in all its branches, mechanical and artistic; in the knowledge of architecture, its history and design, and other allied subjects, proficient in engineering and practical constructional detail. If the student in school is expected to know something of all these things, we cannot expect him to have such familiarity with them on entering an office as to go on in the practice of them with all the smoothness that is desirable in actual work. A graduate in one of these branches might be able to have the "working smoothness of a practitioner" when he entered an architect's office in his special line, but as yet he would not have the education necessary for an architect. The graduate from an architectural school aims at being an "all round" architect; therefore we expect him not to have had a specialised course, but to have been grounded in all branches, "and in this grinding it is possible to give more weight to one department than another, and this seems to be the kind of the question before us." The writer of the paper then says, "The problem then is what branches may be given less time to in order that more attention may be paid to others? That too much attention cannot be given to such departments as are not likely to be thoroughly and correctly looked after is the experience that comes to the graduate after he enters on office work. Of architectural history the student is likely to get nothing in the office, of architectural design he will get some, and in time a great deal, but it will be given in the most unsystematic manner; we believe, therefore, that in those two branches the student should be thoroughly grounded in the school. In office-designing he sees the thing done, but most usually without a reason being affixed; in the school he should be taught how to discover the reason, how to apply the principles governing design, so as to be able to work out for himself the general scheme, for in the office his mind is only too likely to be contracted to that small portion of the work that falls to his share. The argument in the above art that is so commended in the school, for there is little time for such training in the office, so the graduate in beginning his work may be expected to be proficient. With regard to construction and detail generally, this author thinks the graduate should be expected to understand the theory of construction, to have a knowledge of the strength and

possibilities of stone, brick, wood, as well as of iron and steel in their simple constructional forms, but that in details of construction a very general acquaintance would be expected. "The student has been trained to understand general principles, which will enable him quickly to follow the office practice in detail making. It would be idle for an architect to expect a graduate to be educated up to his special idea of the correct form of window-box or wood gutter. . . . In the large office one thing is looked for and in the small something quite different. The graduate who enters an office should be expected to know something about the class of work likely to be done there. In the large office a more general knowledge should suffice; in the small office he should have given more thought to work, such as frame houses." Two classes of architects and draughtsmen are distinguished—the first, designers with a general knowledge of construction; the second, constructionists and practical men with a general knowledge of design. The student early in his college course must discover to which type he leans, and in the school with most ease the studies in that class. Having done so, he must look for a position in an office where one of his type is desired. Another answer (by the Detroit Architectural Club) to the question "What should the schools leave for the office to teach?" is that a student, on entering an office after pursuing a course of study in a school, should be prepared to perform simple office work under the direction of an older man, so that he will be of immediate use and value in an architect's office; besides this he should understand all the general principles of every branch of an architect's practice, so that he may quickly learn the office methods of applying this knowledge. The school should insure general principles; the office should teach the technical application of these principles. A four years' course of architecture gives no time for specialities. The student should not find an excessive amount of his time has been occupied in studying monumental problems, in historical research, and archaeology, in making designs, in applied mechanics, to the neglect of artistic qualities. One or other of these studies often biases his mind. When he enters an office he finds he has not made an adequate study of the art and crafts or of the artistic uses of materials. The school should teach all the fundamental principles which will control the architect in his practice; the office should teach the practical method of applying these principles. The architectural schools, according to this author, ought to instruct the majority of the students in the fundamental principles of those problems in which their future practice will depend, in solving the requirements of ordinary domestic and commercial buildings, the desirable arrangements of given conditions of structure, and their aesthetic expression. Monumental and ideal problems should be left to the student's own choice.

These are, in brief, the replies to the questions we have stated. As American, they are naturally those which the courses of architecture in American colleges suggest; but they also apply to an organised system of professional education in this country. The consensus of opinion is that no school education will teach the student practical methods of applying his knowledge of principles so thoroughly as the office; that classical studies and monumental design can be carried too far, and may indispose the student to the practical problems of building. The question resolves itself into one between the school and the office. There is a tendency to make the school predominant, as the chief factor in the architect's education, and as far as can be to supplant the office; but, as we shall presently say, this is an erroneous way, if we take precedent as a guide.

Two other questions discussed were, "How much mathematical and engineering

training should an architect have?" and "Should design and construction be separated so as to train specialists in each of these lines?" One answer, from the Toronto Architectural Club, is, "An architect should have as much mathematical and engineering training as will enable him to solve by means of formulae derived from the experimental research of scientific experts every problem the creation of a modern building may involve in the safe and economical use of the materials of its construction, including steel construction, heating, lighting, ventilation, and sanitation." The difference between education and merely a knowledge of the expedients of modern practice is borne in mind, for these expedients vary much in different localities, and change from time to time. As the architect's work is the harmonious association of all the crafts, its harmonium can only be complete when the possibilities of each craft are perfectly developed, and for this purpose a knowledge of the nature and function of every material used is necessary. The answer to the second question is that "design and construction should not be separated, because a specialist is one who, in addition to the ordinary knowledge of his craft, acquires a special knowledge of one line, not one who has acquired a knowledge of one line only of the general knowledge of his craft." There are other remarks. "Design in architecture, as seen in the human figure, is 'constructing beautifully.' 'Could we imagine a figure built up of compression members, covered with tension members, and concealed beneath a coat of ornament?' The use of some material is required; it may be stone or wood only, or there may be no stone or wood. We must change with time. Steel construction may be engineering only, covering it with architectural ornament is decoration only. Though the exigencies of modern practice involve the use of specialists, we must consider it as an expedient only. 'The architect is the opposite of a specialist.' These opinions are in agreement with those of the profession on this side the Atlantic; indeed, it is because of the importance of mathematical and engineering knowledge to the architect and the connection between design and construction that the educational movement has been found so necessary. If the architect could do without mathematical training and construction the demand for university courses would not be great. Another exponent of the views of the graduates of Illinois University, Professor White, agrees with the Toronto Club. The answer is that both design and construction should receive equal consideration in a college training. It is pointed out that rarely is a student capable of selecting his speciality; more frequently the outside world realises the strong points of the student sooner than he himself. It is only when he enters an office that he is likely to find the line of work he is best suited for. If he is equally well trained in both design and construction he can work intelligently. An all-round college training is therefore recommended. Design should receive some attention at school, as when the student enters an office he has few opportunities to learn it, the points being settled before he has the drawings to make. The author strongly urges the value of both subjects; for if a design fails to express a simple and rational construction, it fails of its purpose, and, further, the author says: "I am convinced in my own mind that, as far as a college training goes, it should be along a broad line, tending more to train a young man to think for himself than to specialise."

Answering the question, "Is it advisable that the architectural student devote the time necessary to obtain a so-called classical education as a foundation for refined culture and taste, or can the same refinement be gained by studies more closely allied to architecture?"

The different delegates are not unanimous. One says it depends on the individual; some men can never obtain refinement, others acquire it naturally. The classical education is so closely interwoven with many of the studies allied to architecture that either lead to the other, and cannot be divorced. A knowledge of Latin and Greek is not necessary, rather a proper use of books in architecture. It would be more correct to say a course of study of the best books. Another remark is: If "classical education" means the regular arts course of the universities, "it is advisable because it foras a good foundation to build upon in after life; advisable only, however, if a post-graduate course in some recognised school of architecture is to follow. The refined taste and outline can hardly be otherwise obtained." To the question whether the school study of architectural design be limited to monumental problems, one observes "No. But the principal stress should be laid on monumental problems," as they tend to restrain ordinary hackwork. Small house designing is not considered necessary in the school. The office supplies it. Another question: "Should architectural design and study of historic styles follow and be based on knowledge of pure design?" is discussed. One reply is to the effect that they may be carried out together, the definition of valuable as it is as a groundwork does not impart the gifts of creative power and artistic expression, which more frequently develop themselves in the studio, office, or workshop as circumstances arise.

The relation of school to office or workshop is seldom quite realised till after years, when the practitioner begins to discover how much wider the domain of art is than he at first anticipated. When he is engaged in designing or carrying out a residence or a public building, he is apt to dwell upon him that he might have done better if he had knowledge of art, or science, or literature had been a little wider or more exact. A little more science would have saved him from a blunder in designing his dome or roof, in devising a scheme for warming or ventilating, or in planning his public hall for sound. A better knowledge of chemical science would have made him more particular in his specification, in dealing with limes and cements, painting. Had he a classical education, or even a knowledge of classical history or mythology, he would have saved himself from mistakes in designs of decoration for Classical subjects, and it would at least have given him a wider scope for invention. The architect engaged in church design and building might have been more confident if he had studied the history of his art during the Middle Ages, had learned something of ecclesiology, was fairly grounded in theological and liturgical questions, so as not to commit a blunder in the ritual arrangement of the church. A general acquaintance with literature is absolutely necessary for the artist who has anything to do in decoration, in painting or sculptural work; for to design he must have a knowledge of incident and legend, of story and verse, as, for example, in stained glass and decorative subjects, which are largely composed of such elements. Generally, the man who wishes to rise in his profession would be better equipped by a classical education. Many of the great poets devoted considerable time to art, and wrote about it as did Goethe and Schiller, to whom we attribute many philosophical ideas about art, as in the latter's poem "Die Künstler" ("The Artists,") written about a hundred years ago. Similarly a thorough study of art involves a knowledge of classical and modern literature, so that an architect's educational status will generally be found the measure or standard of his art. But it by no means follows from this that art can be taught through the classics, or a scientific course, or by means of a university curriculum.

By "art" we mean the creative ability of the student. We cannot make it by any process or discipline; it must be born in him. No cramming of facts and figures, dates or measurements, no exercise of the memory about styles or historical epochs derived from a college course will supply the deficiency. Instruction on such a basis appears to us in many ways to be a contradiction of this view. Hence from this reasoning we do not believe the mere college-equipped graduate is necessarily better prepared for office duties than the ordinary youth taken from school, presuming both are equally deficient in art perception. Youths with marvellous receptivity for learning and good memories, such as would do honour to any college course, are seldom able to work out any problem that requires constructive skill or originality. The questions considered by the Convention to which we have referred indicate the prominent position of the architectural schools in the States, which have rather tended to obscure the pupilage system. The most useful qualities which a college graduate would bring to his work at an office would be an elementary knowledge of those mathematical principles upon which construction rests, together with the confidence which a liberal education always imparts; but the value of the preparatory studies ends here. Such a preparation, valuable as it is as a groundwork, does not impart the gifts of creative power and artistic expression, which more frequently develop themselves in the studio, office, or workshop as circumstances arise.

THE ARCHITECT AS VALUER.

IN town practice the professional man is called upon to undertake various duties of a character that may be more properly described to belong to the surveyor or agent. He is very often asked to negotiate for a site for a building, to obtain for a client a residence, to report on the condition or repair of a building, to estimate the value of buildings and sites. There are only a few in the profession who can afford to confine themselves exclusively to one branch of architectural practice; on the other hand, a considerable amount of business can be done if a practitioner is willing to undertake various offices that are not strictly architectural, such as making surveys, reporting on valuations, preparing quantities, assessing dilapidations, valuing repairs, and sundry other duties. To a large extent the individual practitioner must be a law unto himself. If he is not over-scrupulous about undertaking work that is outside his own special practice, and has some experience in surveying and valuation, he may often make a lucrative stroke of business. A good deal of legend on his early training and aptitude. Very few men are born valuers, yet by dint of a little knowledge and more tact they often greatly increase their emoluments by taking such business. Architectural practice may not keep the most active and energetic individual; but if to his artistic practice he can combine the office of valuer there is an opening to be made. True, the two things seldom go together. The man who is a gifted designer is very often rather dull or stupid in matters of calculation and exactness, and the man who has only confidence that is wanted. There is, also, a knack in these matters. The most inveterate stickler for architectural design can, if he tries, soon acquire the knowledge of a great many things he regards with abhorrence; it is chiefly the uncongeniality of the pursuit that deters him. A few remunerative openings may be mentioned that are often placed in the way of a local practitioner. The valuation of a town property is one branch of business in these days is a very lucrative business, and is likely to become still more so, and in some

respects an architect ought to be as good a judge as the independent valuer, who approaches the subject from another point. The chief factor in determining the value of town premises, say, for a particular trade is the position. A local architect ought to know which street, or position in a street, is the best for traffic of a kind that is demanded for a particular trade, for it is the purchasing class of pedestrians or carriage people who are chiefly regarded by the tradesman who is about to purchase. But it does not follow that the premises are equal to the situation. The building, suitable enough at one period of the town's prosperity, may in time become too small or inadequate. Who ought to know better the condition of the building for its purpose and its incipient decay than an architect? The premises need to be remodelled at least in their requirements. A larger shop, a more spacious entrance, the facilities necessary for moving goods, ventilation, lighting, new fittings, and many other things need to be remodelled. A considerable outlay becomes necessary which the architect is competent to estimate. A mere valuer would have to consult an architect and obtain an approximate estimate at least before he could make any calculation as to value. For of course the first thing is to find the future rent of the improved premises or the earning capacity of the site, and to do this it is necessary to prepare plans and to obtain an estimate of the building. The value of the property as a whole is required. We must estimate the least value the buildings upon it; for while the value of land generally improves in a good street, it seldom decreases in value: the buildings undergo in the process of time deterioration; they also get out of date, as well as out of repair, so that while the site improves the premises become unfitted and of less value. Consequently the real value of the property will be largely dependent on the building put on the site. Here the architect's assistance has to be tried; he has to make the best of his plan for the site, it must be substantially built and equipped with the latest improvements, there must be not only stairs, lifts, good sanitation and ventilation, and, not least, the appearance of the building must be studied, and it should at least be made to accord with the position and character of the business. Of course the question of alteration, repair, or rebuilding must be decided at the onset, and the architect ought to be able to give an unprejudiced opinion on this point. Sometimes the position may not warrant the re-erection of a new building, in which case the cost of alteration or repair will have to be considered and an estimate obtained. But the architect is the right man to judge. He has to consider the value of the premises as they stand, and whether any addition or improvement can be made to them, or if rebuilding is the more desirable course. In the case of houses, the taste of the rising generation of tenants has to be taken into account, whether by any additions or alterations of plan, such as bay windows, recasting of the front, a better rent may be obtained. It may happen, as it often does, that the house stands on a large area of land, and as this increases in value more houses may be built on the same frontage. Having determined the best means of increasing the value of the building on the land, the architect may begin his calculation. The value of the existing building can be roughly priced at the per foot cube, and this sum deducted from the capitalised value of the whole gives that of the site. In the estimate of buildings, the architect, from his practice, is able to arrive at a fair value; he knows by experience the price per foot cube of different classes of building, a point which the valuer is not so accurately able to decide, and he also can judge better of the construction and materials of the buildings. The ordinary valuer is often influenced unduly by the elaborate exterior, the ornamental

features, and may put a price per foot that is more than it is worth. The improved value that would be obtained by improving or enlarging the building is found by an easy process. If by an expenditure of, say, £2,000 upon additions, the floor-space can be increased, a higher rent can be looked for. The procedure can be found in any book on valuation. If we add to the present rental of the buildings the rent on a proposed outlay of, say, £2,000 at 6 per cent. = £120, we obtain a considerably higher rent; but this may be still further increased by the proposed improvements of a desirable kind.

Very often buildings are seriously damaged by the construction of tunnels, by sinking wells, by tube railways, drainage excavations, and the like, causing drainage of the subsoil water, or by vibration caused by the passage of trains, &c., many cases of which have been before the public of late. The question is one calling for special knowledge and procedure for technical skill. The aggrieved owner or lessee has a ground for damages, and he consults his architect as to any claim he has against the company or adjoining neighbour. In such circumstances the actual fact of injury must be ascertained by examination and inquiry before any steps to assess a fair amount of compensation are undertaken. It is a question first of ascertaining the amount of damage the property has sustained, and then of finding out the cost of restoring the structure and of putting it into a proper condition to let if necessary, added to which any amount of inconvenience, delay, and loss of business that the occupier has to be put to during the necessary repair. The questions involved demand considerable time and attention, whether a movement or settlement has actually taken place, whether it is increasing, whether there is likely to be limit to the mischief, whether it is little or much, trivial or of a serious character. Only a practical knowledge of building can properly diagnose the true state of the case. Subsidence of soil is generally suspected, and this may be due to abstraction of water from the underlying strata, or from some removal of lateral support, such as excavation for drains or deep basements. The damage done may be of a structural or decorative character. In London West-End residences, it may cause the cracking of the plastering on walls and ceilings, the breaking of cornices, the tearing or puckering of the wall-papers, the throwing out of square of windows and door frames, or considerable injury to wall paintings and plaster enrichments. It may be necessary to strut up the openings, to support window and door arches, to shore the walls, all of which precautions must be taken in account in estimating the damage. The basis of the valuation in such cases may be disturbance of premises, loss of business, inconvenience and loss of tenants, the cost of putting the premises in repair. It has been decided that "damages for loss of business" is misleading. Lord Halsbury has said: "In strictness the thing which is to be ascertained is the price to be paid for the land—land with all the potentialities of it, with all the actual use of it by the person who holds it." This was the decision given in the case of a tailor who carried on business on leasehold premises. He claimed for the value of lease, for damages to trade, cost of removal, and fixtures. In assessing the value of land taken for any work or improvement compensation must be awarded to a person who occupies premises, if these are given up, for the loss he suffers thereby. Until he can obtain suitable premises in which to carry on his business, and the same will apply in some cases to a person whose premises are so damaged that he has to obtain other premises. In the actual estimate of putting the premises in structural or tenantable repair, the matter is more direct. A careful specification must be made of repairs necessary to be done, such as underpinning

foundations with concrete, shoring up walls, cutting out loose brickwork in the cracked portions of wall and making good, rebuilding when necessary, replastering or stopping up cracks, repainting and repapering, &c.

To estimate repairs is often a troublesome task; it is not like new work, and it opens the way for what has been aptly called "sporting" estimates and day charges of a very extravagant kind. The architect, at least, is expected to know something of this kind of estimating, and to have by him schedules of prices. An allowance must be made for the time and trouble it gives the workman; he may have to go some miles every day to do the work, and this runs into time and cost—the smaller the item is, the more costly it appears from the disproportion between it and the time spent in journeys backwards and forwards. Such specification items as the following have to be priced:—"Rake out joints of brickwork, clean down, and re-point in mortar. Cut out and repair cracks in plastering, and make good in plaster." "Strip paper off walls, make good cracks, and repaper with paper of p.c. value of — per piece. Cut out loose plaster, renew and make good to laths of ceilings, re-plaster, and leave good." The pricing in each case must be determined by seeing how much is required in a superficial foot or yard. Each is made up of a number of small items, thus:—Raking out joints and cleaning down, say 3d.; materials and labour, painting, say 1 1/2d.; use of scaffolding, about 3d.; 15 per cent. profit making 10s. 3d. or 35 pence per foot. Or, cutting out and removing plaster per yard, say 2d.; new laths and refixing same, 3d.; replastering, say 1s. 2d.; added to materials and profit, say 6d.; total, 2s. 1 1/2d. These prices will vary with the locality and price of labour; but the architect can easily make himself familiar, by dissecting each item, and finding out how long a skilled workman will take in doing a yard. A valuer unless he has had some previous knowledge of builders' work cannot possibly make a valuation of this kind, or he would get a valuation to give him a tender for repairs to form the basis of his calculation. Not a few architects when they have questions or valuation of this kind to consider or prepare, obtain a builder's price for doing the work; but such a course cannot be defended, as the builder is apt to make a "sporting" estimate.

The valuation of fixtures is a kind of work which is often a trouble. A client of an architect in taking or buying a house may be willing to purchase the fixtures at a reasonable sum, and may ask him for an opinion of their value. Of course such a business is not an architect's work, and is properly the occupation of the valuer and appraiser, who is licensed for the work. The deduction to be made from first cost can be estimated after a lengthened experience in appraising such fixtures depending mainly on the condition of the article or its state of repair, and use to the incoming tenant. The development of building land is a more important subject for the architect's consideration, and which presumes on his part a general knowledge of land and its value, of building of the class and rental of houses in the locality, and of the modes adopted in valuation. Gwilt, writing on this subject, makes some useful remarks on the value of town property which should be kept in view. He observes that "it is divisible into two parts—that arising from the value of the soil or site, and that which arises from the value of buildings placed upon it. We will suppose for a house which is fairly let at a rental of £100 per annum, no matter what the situation of it be, that it could be built for £1,000, and that the proprietor or builder would be content with 7 per cent. for the outlay for his money, a rate by no means larger than he would be contented to claim, seeing that the letting after it is built is a matter of speculation, and that loss of tenants and other

casualties may temporarily deprive him of his capital; then the rent of the mere building would be £70, and as the full rent is £100 (£100 - 70 = 30), this latter is the value of the ground or ground rent. Thus in the valuation of freeholds, wherein the gross rent can be accurately ascertained, there can be no difficulty in arriving at the real value of the ground-rent, because the building rent, or that arising from the expenditure of the money on the soil, can be immediately ascertained by the architect, with the rate of interest on it which it is fit the builders should have. The remainder of the rent is that inseparably attached to the value of the soil, and belongs to the ground landlord." He goes on to explain the reason for thus separating the two rents: the ground rent attached to the soil is imperishable, the other part, the building, is the perishable part of it, and this is limited by the durability of the building, which has relation to the time it has been built, and to its substantiality. Therefore the number of years the building will continue to realise the rent is the second ingredient in a valuation, and is a point which none but an experienced person can properly decide.

Of course the rate of interest which the buyer obtains in the investment in the purchase of the perishable annuity from the building, will vary with the market value of money. But in land not built on, the architect has to find out certain things—first the cost of rendering the land available for building. A large portion of this will be expended in forming roads, sewers, and a considerable area will be occupied by roads, &c., so that there will be so much expended on development, which has to be added to the original cost of land, making a certain sum. Next the estimated income derived from so many houses and shops, realising a yearly ground rent, will be another sum to work out. Deducting from the latter sum the developing the land from the first sum, we get the amount of profit that can be obtained. It would be easy to work the above out in figures for any particular case. The architect will have to make preliminary investigations. He will have to consider what class of buildings or houses will be likely to take on a certain site and the rent they will realise. His plan of the estate will show him how many houses of a certain kind he can put on the land, for the roads are made and the ground rent they will produce. Having obtained in this way the estimated ground rents of the estate when fully built, he capitalises it at 25 years' purchase. As an architect, he will be the best judge of how many single villas and semi-detached blocks ought to be placed on certain roads, and how many houses of a smaller kind can be accommodated without injury to the better class. Above all he will take care not to overcrowd his estate, but will leave open spaces for recreation grounds for cricket and lawn tennis, suitable sites for a church and vicarage, school and club rooms, and also will not permit his houses to be built too near the road, but set back with suitable gardens in front that will impart a semi-rural charm to the estate, and attract a desirable class of residents. Good sized back gardens should also be left, and in the operations of laying out the roads and plots it should be his main desire to keep up the rural appearance of the locality by planting trees, single specimens of pleasing shape and growth, as well as occasional groups here and there, retaining as far as he can the character and beauty of the original estate. In this branch of professional work, the architect can do a great deal to mitigate the depressing and overcrowded appearance of the eligible building sites in his neighbourhood by rescuing them from the greed of ground landlords and jerry-builders.

A fire-station is to be built at Patterdale, from designs by Mr. Bintley, of Kendal.

RESISTANCE OF HYDRAULIC MORTARS TO SEA WATER.

ONE of the continually recurring expenses in the maintenance of both river and sea walls is the necessity for repointing them at certain intervals. These intervals are both regular and irregular. In the case of the former type of wall, where the sea is situated on one side of the river, the cost of the upkeep is a fairly constant quantity. But in the latter, where the factor of storms must be taken into account, the expenditure varies very considerably. It is not always in both river and sea walls that the damage done by ordinary wear and tear can be remedied by so simple an operation as that of merely repointing the joints to a depth rarely exceeding an inch. Walls exposed to the action of both fresh and salt water are far too frequently totally neglected, until their condition borders a great deal too near the dangerous limit. There are numerous instances on record in which compressive air has been employed to force hydraulic mortars into the fissured joints of walls which have been allowed to deteriorate under the influence of water action to so serious a condition. Of all hydraulic mortars, that in which Portland cement furnishes the necessary hydraulic properties is the first, and it might be almost stated, practically, the only one. English Portland cement is an intimate mixture of clay and chalk produced by the wet process. (German Portland cement, if we may use the term, is composed of limestone and clay, manufactured by the dry process. Experience has proved that the principal cause of the destruction of cement mortar by the action of sea water is more of a chemical than of a mechanical nature. At the same time, there is no doubt that the other agent is also at work.

The cause of the gradual deterioration of cement mortar in sea water is due to the fact that the chalk which, after the cement has set, is to a great extent liberated, forms with the chemical constituents of sea-water new combinations. These tend to fissure and disintegrate the mortar. It has been proposed to eliminate this disturbing element by the addition of a small quantity of puzzolana or trass. The theory, which is well deserving of consideration, is that the additional ingredients will combine with the free chalk and fix it, thus depriving it of its injurious properties. Both these materials belong to that class of clay earths which contain from 75 to 80 per cent. of alumina, with small quantities of magnesia, lime, oxide of iron and of soda and potash.

Italian puzzolana is a natural product of a volcanic source. It is generally present as a rather coarse grained red, brown, or grey powder, and can be produced artificially by burning clay. Trass has a very similar origin to puzzolana, and, like it, is a naturally burnt argillaceous earth.

To pass from theory to practice, a brief account of a series of experiments just completed with the object of ascertaining the value of the new mixture will be of interest to all those engaged in the constructive arts. Three different brands of Portland cement were selected. Some of the *brignettes* were composed of the cement mixed with sand, and others with trass, and the latter, alone, both fine and coarse. The reason of the distinction was to determine whether the addition of the trass to the cement acted in a chemical or in a purely mechanical manner. After the test pieces had become sufficiently firm, they were immersed in sea water, and left for three months, and the other half in sea water, and there left for different periods, extending as a maximum to a whole year. The results of the trials are well worth attention. They proved that the density of all the *brignettes* increased with the length of immersion, so far as it did not exceed between three or four months. Subsequently to this period, the law failed, and, in some instances, there was, with an increased lapse of time, an actual diminution of density observed in the specimens. In the early stage the density was augmented to a greater extent in sea than in fresh water.

Secondly, it was found that the rate of "setting," or hardening, was nearly uniform for all the test pieces in both fluids. The strength regularly increased up to the same time-limit in both cases, but afterwards fell off, and sometimes altogether ceased. When ordinary building sand was employed, no difference was experienced in the behaviour of rich and pure mortars. But when sand of different-sized grains was mixed with the cement, a larger amount of strength was the result. As a rule, specimens of poor mortars

immersed in fresh water, in which a portion of the cement had been removed, and replaced by trass, or fine sand, suffered a diminution of strength. With rich mortars the reverse took place. A slight addition of trass gave a proportionately greater strength. The behaviour of the test pieces in sea-water presents some rather curious features. After about a week's immersion the mixed mortars evinced a less resistance to both compressive and tensile stresses than the pure mortar. But between this period and the completion of the first month, the specimens to which a small quantity of trass had been added developed greater tensile strength than those in which it was wanting. With respect to compressive strength the conditions were exactly the opposite, since the pure mortars were the strongest.

It may be stated as a general result that cement mortars mixed with fine sand obey the same law, regarding rate of setting, as trass cement mortars, but are much inferior to them in both tensile and compressive strength. This statement tends to confirm the assumption, that the mixture of trass with the cement is of a more intimate character than that of a purely mechanical nature. It will therefore appear, in summing up the evidence before us, that the mixing of small quantities of trass with Portland cement mortars renders them better adapted for the construction of structures and engineering works exposed to the continual violence of the sea. More experiments are required with different brands of cement to fully investigate the whole subject. It is satisfactory to know that these will be shortly forthcoming, and of the deductions to be made therefrom we shall keep our readers well informed. T. C.

THE ARCHITECTURAL ASSOCIATION.

THE NEW DAY SCHOOL.

THE Architectural Association, which, since its establishment in 1834, has been one of the times the most live and representative society of the profession, commences this year an experiment which we heartily wish success to—that of a Day School for young architectural students.

Hitherto it cannot be said that anything like a fair proportion of the members of the Association have availed themselves of the opportunities afforded by its evening classes. There are about 1,400 members of the Association, and barely 20 per cent. of them attend the evening classes and studios.

As it is stated in the "Curricula" of the Association just issued, it has long been evident that the schools should be opened in the day as well as in the evening, and arrangements have now been made to open a complete day course in October next, in addition to the present evening course, which will be continued as heretofore.

Architects feel that perhaps should be given some elementary training preparatory to an office career. Pupils are frequently unable to take advantage of the opportunities offered in an architect's office because they have not previously studied the elements of their work; consequently their progress, by beginning to learn something about architecture when their articles terminate. A year or two spent in such a school as is now established will enable a student to acquire, at moderate cost, the rudiments of his work, before learning in an architect's office the practical details of his profession. The school will have the further advantage of testing the student's aptitude for the profession. If he should find the work uncongenial he can abandon the pursuit of architecture. Many architects do not care to receive pupils who are beginners, but they would probably take young men if well grounded, in many cases the period of pupillage might be shortened.

Students already articled and unable to attend the studio regularly can make special arrangements for partial attendance if desired. In this case they are also advised to attend the evening lectures. The students will be under the direct control of a thoroughly qualified architect as master, assisted by such staffs as may be necessary.

The terms will be as follows: Winter term, commencing Oct. 11, 1901, and ending Dec. 21, 1901; Spring term, commencing Jan. 15, 1902, and ending March 28, 1902; Summer term, commencing April 15, and ending July 15, 1902. The hours will be from 9.30 a.m. to 5 p.m., and 1 p.m. to 2 p.m. Students wishing to join the school must submit a satisfactory letter of recommendation.

tion. The fee for the full course is 12 guineas per term, or 35 guineas per annum; or, for the lectures only, 2 guineas per term, or 5 guineas per annum for either the History or Construction Course. All fees are due in advance, and cheques should be made payable to "The Architectural Association."

After payment of the fees for the first year's course, students will be eligible for election as ordinary members of the Architectural Association without payment of the usual entrance fee of two guineas, and as ordinary members they would be eligible to compete for the prizes and studentships.

The following subjects are included in the curriculum:—

First Year's Course.—The Studio:—The use of instruments and scales, Freehand Drawing, Elementary Perspective, Orders of Classic Architecture, Elements of the Various Styles of Architecture, Principles of Mechanics, Elementary Construction, Sketching and Measuring Details and Portions of Existing Buildings.

Lectures: History of Architecture, 36 lectures (illustrated by visits to buildings and museums); Elementary Construction and Materials, 36 lectures (illustrated by visits to workshops and buildings in progress).

Work in the studio will be carried on daily, varied by visits to buildings, galleries, and works in progress as will be arranged from time to time. The studio will be visited by the master, whose assistant will be in constant attendance during the working-hours of the school.

The lectures will be delivered by the master on two afternoons in the week. There will be 72 lectures, 36 on the History of Architecture, and 36 on Elementary Construction and Materials. Twelve on each subject in the term.

The general idea of the lectures on the History of Architecture is as follows:—1st term: Early History of Architecture in Egypt, Greece, and Italy. 2nd term: Continuation of the subject, with development of Byzantine from Roman work to Romanesque and the commencement of Gothic. 3rd term: Outline of Medieval and Renaissance Architecture, with a sketch of the subsequent history of the art up to the present time.

The scheme of the lectures on Elementary Construction and Materials is as follows:—1st term: Elementary course on Foundations, Brick-work, and Masonry. 2nd term: Outline of Timber and Metal Construction. 3rd term: Some account of Roof Coverings, Plumbing, Plastering, Joinery, and Finishing.

Every student will be expected to take up a course of reading under the direction of the master, and will be required to refer to works on each subject concurrently with the lectures on the same, and for this purpose the studio library will be available.

The master will direct students as to their vacation studies, and a due proportion of outdoor work will be expected of all during the summer. Students are advised to acquire full membership of the A.A. as soon as they have made some progress in their work.

The common room will be available for members of the school, not being full members of the A.A., up to 5 p.m. They will be responsible as a body for the use made of this privilege.

The master of the school will be pleased to give an interview, by appointment only, to each intending student who has entered his name on the books and is proposing to take up the course. A list of the simplest necessary instruments, with notebooks and other requisites, has been prepared, and students are invited to avail themselves of this advice before making their purchases. The character of the instruction will be of a strictly preparatory nature, adapted to pupils proposing to be articled and enter the office of an architect.

In this Day School it is hoped that students will avail themselves to the full of an opportunity given them of acquiring the rudiments of their profession, and will, by diligent study and constant attendance during the course, render themselves fitted to derive the full benefit of their practical work in an office where they can acquire a practical working knowledge of architecture.

The definite direction of the student's tastes and inclinations must come from the architect to whom he is articled hereafter, and from the gradual development of his own skill, knowledge, and character.

The aim of the master will be to direct the student's studies towards the knowledge of all

that is accepted as the best in ancient and modern architecture.

Second Year's Course.—Continuation of the subjects forming the First Year's Course, Advanced Perspective and Sciography, Descriptive and Applied Geometry and Graphic Statics, Principles of Architectural Design.

Students taking a second year in the studio should attend such day or evening lectures as the master may advise, certain evening lectures being open to second-year students without further payment. Further particulars may be obtained upon application to the Secretary, The Architectural Association, 56, Great Marlborough-street, London, W.

As most of our readers know, the master of the Day School is Mr. Arthur T. Bolton, A.R.I.B.A. An assistant master has yet to be appointed.

The ordinary Lecture List and Time Table of the Association for the coming session is a full one. The following is a list of the subjects of the papers at the ordinary meetings:—

- Oct. 11, 1901.—Annual General Meeting at 7.30. The President Addressed and Distributed the Prizes.
Oct. 23.—Conversation at the Royal Institute of Painters in Water Colours, Piccadilly, at 8 p.m.
Nov. 1.—"Cambridge in Early and Medieval Times." Mr. A. Wood, M.A., F.S.A.
Nov. 13.—"The Sanctification of a Country House." Mr. Max Clerke.
Nov. 29.—"Capitals." Mr. Francis Bond, M.A.
Dec. 13.—"Travelling Students' Notes." Mr. J. E. Forbes.
Jan. 3, 1892.—"The Development of Domestic Architecture, from the Twelfth to the Eighteenth Century," illustrated with Lantern Views. Mr. J. A. Gatch.
Jan. 17.—"Architectural and Constructional Engineering." Mr. T. C. Cunningham.
Jan. 31.—"Originality" in Architectural Design." Mr. C. Harrison Townsend.
Feb. 14.—"A Plea for Women Praising Architecture." Miss Ethel Charles.
March 7.—"The Glasgow Exhibition." Mr. J. Miller.
March 21.—"The Dwellings Erected at Fort Sunlight and Thornton Hough." Mr. W. H. Lever.
April 18.—"The Preservation of Ancient Buildings." Mr. W. D. Carver.
April 25.—"Arbitrations." Mr. E. A. Graining.
May 9.—"Artisans' Dwellings" from the Municipal Point of View." Mr. Owen Fleming. "Artisans' Dwellings from a Private Point of View." Mr. Louis Ambler.

THE HEBREW TABERNACLE.

At a meeting of the Royal Victorian Institute of Architects on July 16, Mr. Percy Oakden, A.R.I.B.A., gave an interesting lecture on "The Restoration of the Hebrew Tabernacle." His remarks were rendered additionally valuable by the exhibition of a large model to scale, and the manner in which the various portions of the model were put together afforded much instruction. The lecturer pointed out that all the information concerning the Tabernacle was derived from Holy Writ, and the verses dealing with same were read one by one by Mr. Wilson Bobbs. Mr. Oakden stated that the dimensions of the Tabernacle were exactly half the dimensions for the building of King Solomon's Temple, which structure he promised to deal with on a future occasion. It was a curious fact that the dimensions of the former building were precisely the same as those of the Greek Temples, of which the Temple of Diana at Ephesus was a famous example. The small size of the Tabernacle was most striking. It was 30ft. long by 15ft. broad and 10ft. high at what might be called in a permanent structure the eaves line over the walls. The curtains, however, projected 7ft. 6in. on the horizontal on either side, and some little distance over either end, and were curved by a ridge-pole supported by the apex timbers of the west end, a column in the middle building and an upper column over the five columns or parts which constituted the eastern end. The particulars of construction for the boards which formed the walls on the three sides were minutely described in the book of Exodus, and the way in which the timbers (which were of acacia) were framed and fixed together for temporary purposes was most ingenious. Few or no particulars were recorded as to the fixing of the curtains, but it might be taken for granted that the Hebrews knew well enough how to build a tent. The usual illustrations published for particular purposes were altogether misleading, and the lecturer

gave the illustrations showing the curtains very like a quilt thrown over a bed. Mr. Oakden then described in detail the boards, the bars, and the curtain coverings together with the transverse rails, and pointed out some interesting mathematical conclusions, one of which showed that the 47th Proposition of the First Book of Euclid was evidently well known amongst the higher mathematicians of that day. Dealing with the small proportions of the tabernacle, Mr. Oakden pointed out that the building was not for public worship, but for the offering of vicarious sacrifice.

COMBINATIONS OF BEAMS.

THERE are many circumstances in which architects and builders have to use a combination of two dissimilar materials; for example, the flitch beams so frequently used are a combination of this class—the iron or steel flitch plate bolted inside and between two timbers; or in some cases the flitch plates are outside the one single timber, the combination being firmly bolted together.

Where flitch beams are used the comparative deflection of the timber and the iron should be most carefully considered, as it is essential to the economic success of the combination that the timber beams shall not be of less stiffness than the iron flitch, and so oblige it to take more than its proper share of the load, or that the iron flitch shall not be of less stiffness than the timbers, and so throw too great a portion of the load on to them. Being firmly bolted together, it is obvious that the whole combination must deflect to the same amount and at the same time; but it by no means follows that the iron and timber will relatively carry their right proportion of the load. This is a matter entirely depending upon the relative stiffness of the two materials. The stiffer the material, or, in other words, the less the deflection of the timber under the same load, and the more of that load it is bound to carry, as compared with the portion of the load carried by the flitch, the greater the deflection and the less proportion of the load will it support.

When two beams are side by side, that is, of equal size and strength, there is no difference in the carrying capacity when one of the two is lifted upon the top of the other. They are two independent beams just the same as before; but if the combination of two beams, one over the other, be firmly bolted together, a much greater strength is now found. The depth of the beam is now increased, and as the strength varies as the square of the depth, the reason is obvious.

Sometimes a combination is made by using a rolled joist or girder under or alongside a timber beam, and the following examples of calculation from actual work may be of interest:—

COMBINATION OF GIRDER AND LONGITUDINAL TIMBER UNDER A RAILWAY.

Strength of wrought-iron girders only:—

Clear span = 12ft.

Vertical depth = 85ft. (centre of gravity of flanges).

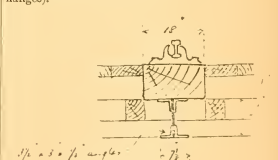


Fig. 1.

Area top flange, two angles, 3 $\frac{1}{2}$ in. \times 3in. \times 1in. = 6sq. in.

Net area bottom flange, two angles, 3 $\frac{1}{2}$ in. \times 3in. \times 1in. = 6.125sq. in.

Dead Load..... = 3.20 tons.

Moving Load..... = 19.78 "

22.98

Stress at centre = $\frac{22.98 \times 12'}{8 \times 85'} = 39$ tons.

Area required, top flange = 32 = 9.75sq. in.

Percentage of required strength, top flange = $\frac{6 \times 100}{9.75} = (61)$

Area required, bottom flange = 32 = 7.50sq. in.

Percentage of required strength, bottom flange

$$\frac{5 \times 125}{780} = .65$$

Strength of longitudinal timber only—

$$\begin{aligned} \text{Clear span} &= 12\text{ft.} \\ \text{Depth} &= 11\frac{1}{2}\text{in.} \\ \text{Width} &= 18\text{in.} \\ \text{Area} &= 18\text{in.} \times 11\frac{1}{2}\text{in.} \\ \text{Dead load} &= .69 \text{ tons.} \\ \text{Moving load} &= 19.78 \end{aligned}$$

20.47

Breaking weight of beam for distributed load—

$$8 \text{ ad } c = 8 \times 11.75 \times 18 \times 11.75 \times .35 = 48.33 \text{ tons}$$

Factor of safety = $\frac{48.32}{20.47} = 2.36$.

Factor of safety required = 2

Percentage of req. strength = $\frac{2}{2.36} \times 100 = \dots (31)$

Strength of wrought-iron girders only (61)

Strength of timbers only (34)

Deflection of girder = $\frac{5 w l^4}{384 E I}$

$$= \frac{5 \times 22.98 \times 144^4}{384 \times 11,000 \times 378} = .22\text{in. for total load.}$$

Deflection of longitudinal timber:—

$$= \frac{5 \times 20.47 \times 144^4}{384 \times 900 \times 2,433} = .36\text{in. for total load.}$$

Where I for girder = 378

" I, timber = 2,433

" E, girder = 11,000

" E, timber = 900

The girder would be deflected—

$$.22 \times .30 = .03 \text{ for dead load, and}$$

$$.22 \times .03 = .19 \text{ for moving load.}$$

The timber would be deflected—

$$.36 \times .69 = .01 \text{ for dead load, and}$$

$$.36 \times .01 = .35 \text{ for moving load.}$$

Proportion of moving load carried by

$$\text{timber} = \frac{19.78 \times .18}{.33 \times .18} = 6.95 \text{ tons.}$$

$$\text{girder} = \frac{19.78 \times .33}{.33 \times .18} = 12.79 \text{ tons.}$$

and as a check on this: If the girder carries 12.79 tons its deflection is—

$$\frac{5 \times 12.79 \times 144^4}{384 \times 11,000 \times 378} = .12\text{in.}$$

and the timber with 6.95 tons—

$$\frac{5 \times 6.95 \times 144^4}{384 \times 900 \times 2,433} = .12\text{in.}$$

The strength of the girder, based on this calculated deflection, is now—

$$\begin{aligned} \text{Dead load} &= 15.99 \text{ tons} \\ \text{Moving load} &= 12.79 \text{ tons} \end{aligned}$$

$$\text{Stress at centre} = \frac{15.99 \times 12}{8 \times .88} = 27.27 \text{ tons.}$$

Area registered top flange = $\frac{27.27}{4} = 6.82\text{sq.in.}$

Percentage of registered strength, top flange—

$$\frac{6 \times 100}{6.82} = \dots (88)$$

Area registered bottom flange = $\frac{27.27}{5} = 5.45\text{sq.in.}$

Percentage of registered strength, bottom flange—

$$\frac{5 \times 125 \times 100}{5.45} = \dots (34)$$

The strength of the timber, based on the calculated deflection, is now—

$$\begin{aligned} \text{Dead load} &= .69 \text{ tons} \\ \text{Moving load} &= 19.78 \end{aligned}$$

$$\text{Factor of safety} = \frac{18.92}{7.67} = 6.3.$$

Percentage of registered strength = $\frac{6.3 \times 100}{7} = (90)$.

Calculation of girder and timber together (area in bottom flange 5 tons per square inch) —

$$\frac{5 \times 125 \times 5 \times 25 \times 100}{8 \times 12} = 15 \text{ tons.}$$

$$\text{Factor of safety} = \frac{31.171}{16.95} = 1.84$$

$$\text{Percentage of required strength} = \frac{1.84 \times 100}{7} = 26.$$

Deflection due to 15 tons on girder—

$$\frac{5 \times 15 \times 144^4}{384 \times 11,000 \times 378} = .14\text{in.}$$

Weight on timber that gives .14in. deflection = $\frac{384 E I d}{5 l^4}$

$$= \frac{384 \times 900 \times 2,433 \times .14}{5 \times 144^4} = 7.88 \text{ tons.}$$

Safe load = $15\text{t} + 7.88\text{t} = 22.88 \text{ tons.}$

Actual load = 22.93 tons.

Percentage of required strength of the combination

$$\frac{22.88 \times 100}{22.98} = \dots (99)$$

COMBINATION OF LONGITUDINAL TIMBER AND SIDE RAILS UNDER A RAILWAY.



FIG. 2.

Clearspan = 9.25ft. = 111in.

Vertical width of beam = 13in.

Depth of beam = 9in.

Area = 13in. x 9in. = 126.75sq.in. = A.

Moment of inertia of beam = 1,601in.

Moment of inertia of rails = I = 28.05in. each.

To find the relative deflection of the beam and the rails.

Dead load on beam—

$$\begin{aligned} \text{Beam} &= .20 \text{ tons} \\ \text{P. way} &= .19 \end{aligned}$$

$$\text{Moving load on beam} = 16.33 \text{ tons}$$

$$\text{Deflection of beam} = \frac{5 w l^4}{384 E I} = \frac{5 \times 16.72 \times 111^4}{384 \times 11,000 \times 1,604} = .14\text{in.}$$

where E = 1,500,000lb. = 669.64 tons.

Deflection of rails:—

$$\frac{5 \times 16.72 \times 111^4}{384 \times 13,393 \times 28.05} = .396\text{in.}$$

where E = 30,000,000lb. = 13,393 tons.

Load carried by beam = $\frac{16.72 \times .396}{.14 + .396} = 7.92 \text{ tons}$ Load carried by rails = $\frac{16.72 \times .14}{.14 + .396} = 8.80 \text{ tons}$

STRENGTH OF BEAM.

Breaking weight

$$= \frac{8 \times 126.75 \times 9.75 \times 35}{111} = 3.17 \text{ tons.}$$

Load on beam = 7.92 tons.

Factor of safety $\frac{31.17}{7.92} = 3.93$ Percentage of required strength = $\frac{3.93 \times 100}{7} = (56)$

STRENGTH OF RAILS.

Moment of resistance, two rails:—

$$\frac{2 \times 29.05 \times 6.5}{2.69 \times 12} = 11.30\text{ft.-tons}$$

Max. bending moment

$$= \frac{8.8\text{t} \times 9.25\text{ft.}}{8} = 10.17\text{ft.-tons.}$$

Percentage of required strength

$$= \frac{11.30 \times 100}{10.17} = (111)$$

STRENGTH OF BEAM ONLY, SEPARATELY.

Breaking weight of beam (as before)..... = 3.17 tons.

Dead load:—

$$\begin{aligned} \text{Beam } 9.25\text{ft.} \times 1.08\text{ft.} \times .812\text{ft.} &= .20 \\ \text{Rails } 2 \times 9.25\text{ft.} \times \frac{84\text{lb.}}{3} &= .23 \end{aligned}$$

P. way 9.25 x $\frac{140\text{lb.}}{3} = .19$

$$\text{Factor of safety} = \frac{31.171}{16.95} = 1.84$$

$$\text{Percentage of required strength} = \frac{1.84 \times 100}{7} = 26.$$

STRENGTH OF RAILS ONLY, SEPARATELY.

Moment of inertia of two rails = 29.05 x 2 = 58.10in.

Moment of resistance of two rails—

$$\frac{5 \times 10 \times 6.5}{2.69 \times 12} = 11.30\text{ft.-tons.}$$

Dead load:—

$$\begin{aligned} \text{Rails } 2 \times 9.25\text{ft.} \times \frac{84\text{lb.}}{3} &= .23 \\ \text{Timber } 9.25\text{ft.} \times 1.08\text{ft.} \times .812\text{ft.} &= .20 \end{aligned}$$

$$\text{P. way } 9.25\text{ft.} \times \frac{140\text{lb.}}{3} = .19$$

Moving load (as before)..... = 16.33 tons.

$$\text{Max. bending moment} = \frac{16.95 \times 9.25}{8} = 19.60\text{ft.-tons.}$$

$$\text{Percentage of required strength} = \frac{11.3 \times 100}{19.6} = 58.$$

THE DISMISSAL OF THE SURVEYOR OF FULHAM.

A LIVELY INDIGNATION MEETING.

A MEETING called to protest against the dismissal of the surveyor of Fulham (Mr. Charles Botterill) by the Borough Council was held at Fulham Town Hall on Tuesday night. The large hall was crowded before the meeting had been long in progress. Many disorderly scenes were witnessed. Among those present was a large body of supporters of the policy of the progressive party, by whom Mr. Botterill's dismissal was effected, and while they gave a fair hearing to Councillor Avern—the Progressive leader—who stated the reasons for the action of the majority of the council, they continually interrupted the supporters of the surveyor when they attempted to speak, and it was with difficulty that they made themselves heard. At different periods the interruption lasted for minutes at a time, and appeals for a fair hearing were made in vain. Mr. W. March presided.

Councillor Avern spoke for considerably over an hour in justification of the action of the Borough Council. He declared that it had been stated broadcast that the object of the meeting was to bring Fulham into such odium in the eyes of professional men that no man of first-class ability would apply for the position, and that should there be any man who, in ignorance, had applied for the position, he would withdraw his application. It rested with the meeting whether they were going to encourage a man of first-class ability or deter such a man. There were no charges of corruption, fraud, perjury, or personal dishonour attaching in the case of Mr. Botterill. Against the character of Mr. Botterill as a man they alleged nothing. The fact that influenced the minds of the majority at the council was one of efficiency and capability, and nothing else. He then proceeded into details in alleging, among other things, bad supervision on the part of the surveyor, and extravagance in the matter of the hiring of horses.

Councillor Mr. Arthur moved a resolution protesting against the arbitrary and unjust action of a small majority of the members of the Council in the dismissal, without reason, of Mr. Botterill. A.M.I.C.E., after sixteen years' faithful service, placing on record their appreciation of his business abilities and courteous manner in the discharge of his duties, in the initiation and completion of the most important improvements made from time to time in the borough, and assuring him of the fact that he still retained the confidence of the general body of ratepayers.

Councillor Mr. Arthur replied to the charge that had been made against the surveyor, and warmly defended Mr. Botterill.

Mr. Stuart Barker seconded the resolution, and Councillors Cooney and Scriven having spoken, the resolution was put to the meeting, and declared by the Chairman to be carried by a majority of the ratepayers present.

HOW TO ESTIMATE: OR, THE ANALYSIS OF BUILDERS' PRICES.—XXII.

By JOHN T. RIA, F.S.I., Surveyor, War Dept.

IRONMONGERY.

THE following prices are from the catalogue of a well-known firm, from which deduct 20 per cent. trade discount. Add cost of screws, finishing, and 10 per cent. builder's profit.

There is no landing-rate on balk timber.
All timber under 9in. square is landed on the

Year.	England and Wales.*		Scotland.		Ireland.		United Kingdom.†	
	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.
1894	23,702	—	7,965	101	951	—	32,618	101
1895	14,371	—	9,900	—	160	—	24,431	—
1896	74,551	4	9,130	30	4,801	—	88,282	24
1897	143,527	—	13,701	—	3,491	—	157,719	—
1898	66,198	—	8,420	—	107	—	74,725	—
1899	47,124	—	18,088	—	154	—	65,242	—
1900	65,785	—	7,000	8,697	378	—	69,863	8,697

* Including a few workmen in the Isle of Man.

† Excluding workpeople affected by upward and downward changes during the year, but whose wages at the end of the year stood at the same level as at the beginning—viz., 274 in 1894, and 40 in 1900.

tough, but cannot be worked so easily. For an underground or water works, Mr. Ednie Brown says, "the timber is certainly inferior to some other kinds, especially to Jarrah; there can be no doubt about this fact, which has been demonstrated time after time in the colony. Still, it is only fair to say that instances have been brought under my notice which prove that some of the timber have been known to have been in the ground for 30 and 40 years with only an ordinary amount of decay. This is certainly very puzzling, and makes one doubtful in regard to the conclusions generally which have been arrived at in regard to this timber. However, as may be seen from the comparative tests and trials, which have been made in regard to its tensile, crushing, and breaking strength, it is a timber of a very high order. We must, therefore, pending other and more general experiments, look upon the Karri timber as one best suited for superstructural works. For bridge planking, shafts, spokes, rollers and large planking of any sort, warping, general wagon-work, beams, it is unequalled in this colony. In lateral strength it is very much stronger than Jarrah; and for works requiring the bearing of considerable weights, such as bridges, floors, rafters, beams of various kinds, it is of great value. In our railway sheds the wood is now much in use for the construction of waggon-ways of all sorts. It shrinks laterally, but not to any great degree in a longitudinal direction. Altogether, the timber is a most valuable one. For street blocking it is most valuable, and for this purpose seems to be equal to, if not better than, the Jarrah. In that its surface, by the wear caused by the traffic, does not render it so slippery for the horses' feet."

WAGES IN THE BUILDING TRADES DURING 1900.

THE Labour Department of the Board of Trade reports that the steady rise in wages in the building trades for several years past, to which attention was drawn in the last annual report, received during 1900 a check in Scotland, but continued in England and Wales. The facts are brought out in the above table, which shows for the principal divisions of the United Kingdom the number of building trade operatives affected by changes in each of the years 1894–1900, distinguishing those whose wages were increased from those whose wages were decreased.

It will be seen that while there were no reductions in 1900 in England and Wales, in Scotland no less than 8,697 workpeople sustained decreases, including 2,000 operatives at Aberdeen, 4,150 at Edinburgh, 730 at Dundee, 370 at Kirkcaldy, and 280 at Perth. The occupations chiefly affected in this way were masons and carpenters.

The 68,755 workpeople affected by advances in England and Wales included 27,000 operatives in London, 4,600 in Bristol, 2,600 in Cardiff, 2,600 in Bradford, and 2,000 in Birmingham.

In the following table the net results of all the changes in these trades in the United Kingdom during the last eight years are summarised:—

Year.	Number of work-people affected.	Net amount of increase per week in wages.	
		Total.	Average per head of those affected.
1893	44,538	£3,372 19	1 5 5
1894	22,693	2,334 0	1 8 3
1895	24,431	2,066 0	1 8 3
1896	88,946	9,140 15	2 0 2
1897	83,219	8,832 13	2 1 1
1898	83,219	7,739 9	2 0 3
1899	74,725	6,640 3	2 0 0
1900	75,930	6,410 7	1 8 4

The number of workpeople affected by wage-changes in 1900 was 78,600, or rather less than

10 per cent. of the total number engaged in these trades according to the census of 1891.* If the net aggregate advance (£5,640) were spread over the total number the average weekly advance would be about 2d. per head, the same as in the previous year. The result to the 78,600 who were directly affected was an average rise in their weekly rates of wages of 1s. 8½d. From the following table, which shows the distribution of the changes in each of the principal trades, it will be seen that while carpenters and masons account for the bulk of the workpeople affected, the net increase per head of those affected was highest among plasterers and plumbers. The reason for masons is brought down to 2d. per head by the reductions in Scotland, and the carpenters' result is reduced in the same way, though not to the same extent.

Occupation.	Number of work-people affected.	Net weekly increase per head of those affected.
Carpenters and joiners	39,909	1s. 8d.
Masons	17,765	0 2
Labourers	7,905	1 8 1
Painters and decorators	6,409	1 11
Plasterers	5,362	3 4 1
Bricklayers	3,885	2 1 2
Plumbers	1,501	2 1 2
Slaters and tilers	52	2 0

CHANGES IN HOURS OF LABOUR.

For some years past there has been in these trades a considerable number of reductions in the number of hours constituting a full week's work exclusive of overtime. In 1900 the number of those whose hours were changed shows a falling off compared with previous years, and will be seen from the table below. Of the 9,111 workpeople affected 8,376 had their hours reduced on an average by 1.66 hours per week, and 735 had them increased by .85 hours, the average of all the changes being a net reduction of .88 hours. The numbers affected by changes in hours of labour and the average effect of the changes for each year of the last eight years are given in the following table:—

Year.	Number affected by changes in hours of labour per week.	Average Decrease in the Weekly Hours of those affected.	
		Hours.	Minutes.
1893	13,265	1 40	—
1894	10,162	2 38	—
1895	12,900	1 46	—
1896	79,730	0 05	—
1897	10,084	1 18	—
1898	10,322	1 32	—
1899	10,663	0 93	—
1900	9,111	0 88	—

The proposed railway line in Kashmir, about to be undertaken, will run from Jammu to Srinagar along the Laruluri and Banihal Passes. The height of the top of the latter Pass from mean sea level is 9,328ft., and will be crossed by a tunnel about 5,070ft. long at a river level of 7,700, the datum being mean sea level. The height of the Laruluri Pass is 6,720ft. from mean sea level.

The Iron and Steel Institute of Great Britain opened its autumn meeting in Glasgow on Tuesday, sitting also as one of the sections of the International Engineering Congress. Mr. W. Whitwell, the president, delivered his opening address, in which he dealt with the progress of engineering science since the inauguration of the Institute in 1871. A report of the Committee of the Scottish Iron and Steel Institute on the iron and steel industries of the district was read, and a paper by Mr. A. Wahlberg on "Carbon and Phosphorus in Steel Billets" was submitted and discussed.

* The results of the recent census are not yet available, but it may be assumed that the total number employed in the building trades has increased since 1891.

PROFESSIONAL AND TRADE SOCIETIES.

BIRMINGHAM ARCHEOLOGICAL SOCIETY.—The twenty-sixth volume of the "Transactions of the Birmingham Archaeological Society" contains, in addition to reports of meetings, &c., a full reproduction of four papers presented to the members during the session of 1900. The first of these embodies the researches of the Rev. A. C. H. into the history of Mancetter, the ancient Manduessedum Romanorum. This paper is illustrated with views of the Manor House, the church of St. Peter and its peculiar 15th-century baptismal font. Mr. Francis B. Andrews, A.R.I.B.A., writes upon medieval houses and barns, commonly described as "tith barns," some of them being very fine pieces of work. Among the examples specially commented upon and illustrated are the five barns at the Bedford Court, and at Bredon, Worcestershire; also the Littleton Barn, near Evesham. Illustrations are given of the internal timbering to be seen in the roofs of the barns at Stanway, Gloucestershire, and at Bradford-on-Avon, Wilts. At the close the writer gives a list of the ancient buildings of this character which still exist or are recorded to have existed. "Some Notes on the Domesday Book, especially that part of it which relates to the county of Warwick" is by another A.R.I.B.A.—Mr. Benjamin Walker. He directs attention to some interesting matters of spelling and nomenclature found in the Domesday survey, and then submits, with comments, a map of Warwickshire with all the places mentioned in that celebrated record. It appears that of the fourteen pages of the survey relating to Warwickshire reference is made to between 260 and 270 places, of which more than 240 have been identified. Appendices to the paper contain formal lists of names, &c., useful for reference. The fourth paper is a contribution by Mr. Harold S. Thompson, F.L.S., "On the Study of Topography."

SANITARY INSPECTORS' ASSOCIATION.—The autumn conference of the Sanitary Inspectors' Association was held at the Carpenters' Hall, London Wall, on Thursday last week, and was attended by sanitary inspectors representing 63 local authorities. Sir H. Gilzean-Reid, president of the association, occupied the chair, and, in welcoming the delegates to London, said that the association continued to increase in numbers, strength, and in usefulness. Sir A. R. Binnie, chief engineer to the London County Council, read a paper on the main drainage works of London, and a paper relating to the same subject by Professor F. Clowes, chemical adviser to the London County Council, was also read and discussed. The drainage, sanitation, and lighting of the Houses of Parliament were described in other papers. Sir J. Crichton Browne read a paper on "Tuberculosis," in which he strongly questioned the soundness of Dr. Koch's views on the non-communicability of bovine tuberculosis to human beings, doubted the expediency of proclaiming them without more thorough investigation, and urged the necessity of a searching Government inquiry. A resolution in favour of such a Government inquiry was adopted. The conference dinner was held the same evening at the Holborn Restaurant. Sir H. Gilzean-Reid presided, and was supported by Mr. S. Sedley-Smith, President of the House of Commons (Deputy), Sir A. Binnie, Sir J. Crichton Browne (the Mayor of Southend), Mr. H. L. Tangey, and others. Mr. W. H. Grigg (chairman of council) proposed the toast of "The Association." Sir J. Crichton Browne, replying to the toast of "Science and Sanitation," said that association was formed to promote the efficiency of sanitary inspectors as well as to defend their interests. The time had come when some adequate test should be required from everyone appointed to the post of sanitary inspector, and when sanitary inspectors should have security in the tenure of their office, as well as adequate remuneration and pensions.

The ceremony of opening the James Watt Engineering Laboratory took place in Glasgow on Tuesday, in the presence of a large company of ladies and gentlemen in attendance at the meeting of the Engineering Council.

The foundation-stones were laid on Friday of a new Wesleyan Sunday-school in connection with Victoria-street Church, Douglas, Isle of Man. The old structure had done service for nearly 80 years, and was in a very dilapidated condition. The new building, which is to cost about £3,000, will accommodate 600 scholars.

Engineering Notes.

ABRIDGE.—The Harbour Commissioners of Aberdeen made their annual inspection on Friday of the works under their charge. Commencing at the west end of the locks, the members first visited the new temporary shoals that have been erected on Regent Quay to provide facilities for the shipping, whilst the larger accommodation is being completed. Owing to the limited quay space the commissioners have been compelled to adopt the two-story style of shoals. Operations on the extensive scheme for the reconstruction of Regent Bridge have been in progress since when the old bridge has been removed from the old passage to the new. For the needs of the cross traffic vehicular and pedestrian—a temporary buskard bridge has been provided. The electric machinery has not yet been fitted up, but a couple of months should see it in its place. The new Regent Bridge, which is to cost about £50,000, will be finished about this time next year. From this point the party went to the block yard of the graving dock, where the granite-faced concrete blocks for the Regent Quay widening and the bridge reconstruction are already finished, and waiting to be put in position. Embarking next at St. Matthew's Quay, the company inspected the widening which has recently been effected at this place, and sailed round the Albert Basin, taking the new extension of the Fish Market, Pontoon Dock, and Point Light improvements on their way. They then proceeded down channel, where a close examination was made of the rock dredging operations that are being conducted there. At present the large dredger is engaged cutting a deeper channel to suit the bigger class of ships now coming to the port—the cut being 200 ft. wide by 3 ft. deep. Information as to the works in progress was furnished by Mr. R. G. Nicol, the engineer, and Mr. James A. Ross, harbour treasurer.

FELLING SHORE, GATESHEAD.—New railway lines and fresh staiths are being carried out at Felling Shore for Messrs. John Bowes and Partners, Limited, Felling Colliery. The alterations and improvements consist of a new railway line, with light way lines on either side, together with a big range of coal staiths. There will be required the excavation of 50,000 yd. of earth to make room for the railways; and for the staiths, somewhere near 40,000 cu. ft. of timber will be required. The staiths are to be erected 65 ft. above high water. A steam navy is at work capable of excavating between 7000 yd. and 8000 yd. of earth per day, while in addition to the steam navy there are about 100 men employed in the excavations. The staiths are to be capable of shipping 5,000 tons of coal per day. The usual method has been to have the timber for such undertakings crosscut, but in the present case it is to undergo a process of Huskising, named after the inventor, Colonel Huskin. The work will be in progress for another twelve months. The contractor is Mr. H. M. Nowell, of Leeds, and Mr. W. W. Wainwright, agent and engineer for the contractor. The resident engineers for the works are Messrs. Sandeman and Moncrieff, 1, St. Nicholas Buildings, Newcastle-on-Tyne.

MIDDERSEX LIGHT RAILWAYS. The Board of Trade, after mature consideration, have informed the Middlesex County Council that they have decided that the objections raised by the Finchley District Council to the confirmation of the order enabling the County Council to construct a light railway from Upper Holloway to Whetstone cannot be sustained. The Light Railway Commissioners refused to give the Finchley District Council's application to run lines under the Act at the time the County Council's scheme was before them. There are now only the details of the scheme as passed by the commissioners to be dealt with, and there is no doubt that the order will be confirmed, and the County Council, who have now engaged a special staff to carry out the construction of the lines, will immediately begin the work of laying the 15 miles which form the first part of the scheme.

The new Lions' House at Clifton Zoological Gardens, Bristol, has just been opened. It has been built from plans by Messrs. W. S. Paul and James, A.A.R.I.B.A., Bristol, and was illustrated by perspective and plan on a special sheet in 1900. The contractor was Mr. J. Perkins, of Redland, Bristol, and Mr. W. Brok the clerk of works.

Building Intelligence.

EDMUNDSON.—On Tuesday, the Edinburgh board schools were reopened for the winter session. During the summer vacation considerable painting and a number of minor alterations have been carried out at several of the schools; but the most notable feature in connection with the resumption of the winter's work was the opening for the first time of two schools, which will afford additional accommodation for 2,860 pupils. One of these, the Flora Stevenson School, is situated at Comely Bank, on the site of the old Home for Lost Dogs. It accommodates 1,400 pupils. The other, the Princes Road School, provides for 1,460 pupils. There was also opened a new infant school attached to the North Canongate institution, and on the site of the old school in New-street. It accommodates 730 pupils. Its entrance is from New-street, but access is also had from North Canongate School. The infant school is a building of two stories and a lower floor, which enters from New Market-street. This lower floor contains a playroom and a bathroom. On the ground floor from New-street there is a large central hall, with five classrooms entering from it, and teachers' accommodation. On the floor above the gallery runs round this hall, and from it seven classes have access. The plans were prepared by the late Mr. Robert Wilson, under whose superintendence, before his death, the construction of the three new schools mentioned was carried on. Princes School has been completely reconstructed, with the view of having additional light introduced.

PANVERDUN, DARTMOUTH.—On Saturday the church of St. Michael and All Angels, Jivington, in the parish of Lydford, was reopened by the Bishop of Exeter after extensive restoration and enlargement. The work has been carried out by Messrs. Peterkirk and May, contractors, from plans by Mr. Edmund Sedding, F.R.I.B.A., Plymouth. The church was burnt down by the American prisoners of war about 1846. They made all the walls the same thickness, including those of the tower. In consequence, this part of the structure had to be braced together by girders about fifty years after its completion, and no bells were left in the dialway tower, except those of the town possessed any. The form of the church was a simple parallelogram about 50 ft. long, the width being only 6 ft. short of the length. The ceiling throughout was flat. The four windows on each side had the glass set in strong iron lattice work as a safeguard against an escape of prisoners, who formerly used to attend this church. The treatment which contained the prisoners of war has now been transformed into a convict prison with a chapel of its own. The building has been lengthened 40 ft. eastward, making a total internal length of 90 ft. Two arcades have been erected to form the area into nave and aisles. The old roof, which had no interest attached to it, has been removed, and a new cradle roof constructed over the nave, with lean-to roofs for the narrow aisles. Unfortunately, the ugly side windows have had to be retained for the present, owing to the expense of funds to replace them with better and better glass. The architect would have preferred granite being the local stone for the new arcades and large east window, but the extra cost above that of polytham—no less than £300—placed it out of the question. The arches are of the same height as the square piers, and the piers being 22 ft. The piers are square, with a considerable upward taper. Each bay consists of twin arches boldly moulded, with a space between them. The double arch dies on to the massive piers. There is no clerestory, but over each column a light opening through the wall containing tracery. These openings give an original effect to the building. The large east window is divided up into three lights of massive mullions. The floor is temporary throughout, and considerable time must elapse before the proposed improvements and other improvements can be carried out.

THE OXFORD.—Under the superintendence of Messrs. Wilson and Long, the house has been re-decorated from floor to ceiling, the whole of the seating has been changed, new carpets and upholstery have replaced the old, the stage has been considerably enlarged, and a most important extension of the gallery—street music—has been made in the shape of an additional tier for the audience, and a stage entrance for the artists and workers, whilst a new duplex electric-lighting installation

has been provided, the circuit being so distributed that should one source of supply break down the business can be carried on by the alternative supply without interruption. The internal appearance of the theatre is striking; the tones of the wall and ceiling decoration are kept subdued, ivory and gold being the prevailing colours, which are relieved by touches of a deep rich crimson. A new feature in theatre decoration has been introduced in the use of art metal. The whole of the pillars are incased with hammered and repoussé copper, and the dados on the ground floor and balcony contain panels of raised glass metal. The stage has been redecorated, and a new foyer in the balcony level has been commenced. A new and larger box office in the western entrance replaces the former inconvenient one.

WYMONDHAM.—Preparations for the restoration of the parish church are being rapidly pushed forward. All the old pews have been cleared away, and the altar reading desk, screen, pulpit, and font have been removed from the nave, which is now filled with scaffolding to enable workmen to commence as early as possible with the work of repairing the roof. The organ, which was placed in the western gallery in 1793, has been taken down and stored away, and the choir gallery, as admitted of, has been dismantled. For the present the Sunday services will be held in the north aisle, which has been specially partitioned off, and fitted for that purpose. Mr. W. Scoble Hick, of Messrs. Hick and Charlewold, Newcastle-on-Tyne, is the architect, and Messrs. Rattee and Kett, of Cambridge, are the builders.

CHIPS.

Mr. Ellis Marshand, Hon. Sec. of the Society of Architects and district surveyor for Camberwell, has been elected Master of the Worshipful Company of Tylers and Bricklayers for the ensuing year.

The site for a new covered market for Dewsbury is now being prepared. The plot chosen is opposite the terminus of the Great Northern Railway, and on the north side of Corporation-street. The structure is expected to cost £3,000.

Bench marks on trees change very slightly, according to some notes by Mr. Geo. W. Cooley, in the *Journal of the Royal Horticultural Society*. His experiments have lasted many years, and were made with benches established in the usual way on linden, hickory, maple, and elm trees. The changes are not cumulative. The greater the sixteen years was about 0.01 ft., while an equal or perhaps greater variation occurs frequently in one year.

The Archbishop of York recently condemned certain ornaments in the Church of All Saints, Scarborough. The Rev. Dr. Eyre, the new vicar, and his wardens have disposed of the triptych and the Spanish pulpit crucifix to a well-known art dealer for £90, which amount has been expended on lighting the church with electricity.

A new Roman Catholic church is in course of erection in West-street, Sittingbourne. The building, which adjoins the Presbytery, is to be known as the Church of the Sacred Heart of Our Lord Jesus Christ, and has been designed by Mr. Leonard Cresswell, of Bath. The church will be open within the nave on arches, and the chancel is divided by an arch and will be apsidal in form. A small vestry is provided for. The north entrance will be reached by a series of niches above and on either hand of the opening.

The members of the Wesleyan Chapel, Lower-road, Deptford, not having money with which to redecorate and renovate the building, a few weeks ago resolved to do the work themselves, and, headed by Mr. F. W. Redman, they have been busily engaged early in the morning, and sometimes up to midnight, in painting, whitewashing, and colouring the interior of their meeting-house, while not neglecting to have the work of the carpenter practically completed, and on Wednesday week the chapel was reopened. The sole expense has been about £25 for material, even the scaffolding having been lent and erected free of cost.

Works for the supply of electricity for lighting and traction purposes carried out by the Farnworth Urban District Council were opened on Wednesday last week.

The East and West Yorkshire Union Railways Company are going to run passengers to and from Leeds. Huddersfield, however, some nine miles in length, has been devoted to goods and mineral traffic, but an agreement has now been come to with the Midland Railway Company, permitting of a junction being formed with the Midland main line at Stourton, and of passengers being conveyed to and from Wellington Station in Leeds.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many demands upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bound copies of Vol. LXXX. are now ready, and should be ordered early price 12s. each, by post 12s. 6d., as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLIV., XLV., XLIX., LI., LIII., LXI., LXII., LXIII., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., and LXXIX. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Haddome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

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The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

RECEIVED.—P. G. A.—S. B. C.—J. and T.—H. and Co.—L. F. D. Co., Ltd.—J. T. L.

A. R.—Ripolin, in our opinion, is far superior. Besides, you can get it in so many more shades. The other wash you mention is thirty years out of date.

J. D. T.—Hobbs and Co. are the leading makers.

R. B. D.—Canoe any? Possibly there will be another legislation before long.

BRECHWOOD.—We think the Council has power to refuse.

Correspondence.

ARMOURD CONCRETE IN
FORTIFICATIONS.

To the Editor of the BUILDING NEWS.

SIR,—I have read with interest an article on this subject in your issue of the 30th ult., signed "T. C." Having devoted considerable attention to the suitability or otherwise of armoured concrete in fortification work, I have come to the conclusion that the insertion of iron in the concrete considerably increases its power of resisting shocks caused by explosion. The only objection I find against its use is the increased cost and the necessity of employing skilled labour.

Only last month I was present at some important trials made by the War Office, and amongst many other experiments two beams or slabs were exploded; they were constructed as follows:—First slab, 3ft. thick, with a span of 10ft.; by 10ft. wide, supported on concrete abutments, the concrete being 4 to 1 Portland cement. Second slab of 1ft. thick, heavily armoured internally with iron bars, but otherwise of the

same dimensions and strength of concrete as No. 1 slab.

Upon each of these structures a 9-2 lyddite shell was exploded, with the result that No. 1 slab of 3ft. concrete was simply pulverized and left no trace of its original form. No. 2 slab, of 1ft. armoured concrete, was found to be seriously damaged and cracked, and upon one side presented the appearance of an inverted arch. But it was apparent to everyone present that the 1ft. of armoured concrete better resisted the explosion than the 3ft. of concrete. The opinion I formed was that with a thickness of 3ft. of armoured concrete I could design a beam that would successfully resist a 9-2 lyddite shell.

Some very interesting experiments were carried out in the year 1898 by the military authorities at Vienna, in order to ascertain the effect of strong explosive force on an armoured concrete arch of 3ft. span, the arch being 5in. at the crown and 14in. at haunches. The enclosed photos were taken after the trials.

First a set of erosive cartridges sufficient to destroy a solid stone arch of 3ft. thickness, and the same span, were placed across the arch, the explosion causing only the partial injury seen, the rest of the arch remaining intact.

At the moment of explosion the arch deflected about 5in., but immediately returned to its normal position without showing cracks, thus

demonstrating the extraordinary elasticity of the combination of materials.

A double set of cartridges were now placed across the bridge, about the same distance from the centre, but at the other end. This charge was sufficient to blow up a stone arch 6ft. thick. It had the effect of breaking the arch through at this point, but the remaining portion of the arch was still practically unimpaired, except from the local injury of the first explosion.

I think the results of the above experiments bear out my contention that iron, used with discretion, will considerably strengthen concrete for fortification work; but whether the cost will prove prohibitive, although it is much used on the Continent, upon this I am not able to pass an opinion.

Apart from the question of fortifications, it seems really strange that armoured concrete is not more extensively used in England, for it is the most fireproof form of construction known. It could in most cases take the place of iron columns, girders and joists, and wooden flooring, all of which figure badly in a serious conflagration. It is especially suitable for cold storage and all sorts of reservoirs and tanks; and when compared strength for strength, it is about 15 per cent. less in cost than other structures.—I am, &c.,

A. JONNSON, M.Inst.C.E.
5, Westminster Palace-gardens, Artillery-row,
Victoria-street, London, S.W.



CORRECTION.

Sto. In referring to your issue of August 30, we notice in "Chips" (p. 300) a note to the effect that the walling of the Bury Art Gallery is in local stone. In this there is some mistake: the whole of the stone used in the erection of this building was supplied from our original quarry Dale-Stone life-quarry, from which the stone for St. George's Hall and the New Walker Art Galleries and Technical School in Liverpool was also supplied. The stone was also supplied from this quarry for the Royal Exchange and the County Council Courts in Manchester, and for many other public works, notably the Nottingham and Linsdownshire County Asylums. If you will be good enough to correct the error in your next issue we shall be glad. — We are, &c.,

THE SPAIN-LITE ESTATES CO., LTD.

CHIPS.

The urban district council of Baildon has accepted the tender of Mr. Wm. Brigg, of Friesinghall, Bradford, for £11,900 for works of sewerage and sewage disposal for the districts of Baildon, Bottom, Baildon Green, Lower Holme, and Low Hall, and the works are to be proceeded with immediately. The engineers to be the Messrs. Beesley, Sous, and Nohols, Westminster.

Lord Morpeth on Saturday opened the fifth annual exhibition for the purpose of sanctioning the Landed Aristocracy and Crafts Society in the Art Gallery of Tullie House, Carlisle.

The Burma Government spent 26,12,366 rupees on new buildings last official year, as compared with 14,31,871 rupees on new roads. Building in Burma cost more than three times as much as in some Indian provinces. They give a return of 2-78 per cent. in rent, a higher amount than what is realised in Bengal, Assam, the North-West Province, or the Central Provinces.

Mr. C. H. Schaller, of York, has been invited to report on the condition of Ripon Corporation Gasworks.

Mr. W. O. E. Meade-King, Local Government Board inspector, conducted an inquiry on Tuesday at the Municipal Buildings, Plymouth, in respect of an application by the Corporation for sanction to borrow £90,000 for works authorised by the Plymouth Corporation Water Act, 1893, and for the extension and improvement of the waterworks. Mr. F. H. Howarth, borough water engineer, explained the proposals.

The Duchess of Beaufort opened on Wednesday a bazaar at Avening Court, Gloucestershire, in aid of the restoration of Avening Church at a cost of £3,000. The church is one of the oldest in the country, and considerable portions of it exist which were consecrated in 1070, after being rebuilt under the personal supervision of Matilda, Consort of William the Conqueror. The church contains a monument to the Duchess of Argyll, the wife of Lord Chomondy, who, expousing the rights of the Protestants during the reign of Queen Mary, was driven from home, and took to the road. In later years he was a constant supporter of the church, and the monument was raised to his memory.

October 1 is fixed for the unveiling, at the Alexandra Palace, of the statue of the late Queen Victoria, presented to the trustees by the sculptor, Mr. Goslow Ford. The statue is 30ft. high.

Mr. Messrs. James Towell and Sons at the Whitefriars Glass Works, in Gloucestershire, have just completed a stained-glass five-light east window at the Protestant church, Frankfurt. It has been the aim of the makers to give to the window a mosaic appearance rather than the ordinary German pattern effect. The background of the window, which is about 15ft. by 12ft., is formed of mother-of-pearl coloured pressed glass. The main group represents the Adoration of the Infant Christ by the Magi and the shepherds, with the bright star overhead. Under this is the inscription "Gut mit uns," and on either side are figures of Christ and the Good Shepherd and the Infanter. Below are other groups, the principal of which are the Angel with the sword, an armour bracing the serpent, with Adam and Eve in the background—the sacrifice of Isaac, Moses raising aloft the brazen serpent, and Zion rejoicing at the entry of the Lord into Jerusalem, as prophesied by Zachariah. The window has been designed by Mr. James C. Powell.

All the lifts in the Newport and Monmouthshire Hospital, recently opened, have been supplied by Messrs. Archibald Smith and Stevens, of Janus Works, Queen's-road, Battersea.

A preaching cross, 15ft. in height, has been erected in the church-yard of St. Mary, Hagerston. The base from which the shaft springs is ornamented with four panels in high relief, the subjects being the Nativity, the Circumcision, the Good Shepherd, and the Virgin and Child.

Entercommunication.

QUESTIONS.

(11775.)—**Making Good Defects in Stone.**—There is a local stone used in the building of French manufacture used for making good defects in old stonework, church windows, &c. I should be glad if you could tell me how it is made.—A. STEVENSON, BRISTOL, THIRTY YEARS.

(11776.)—**Saashe.**—Will some brother-render kindly say if it is allowable in a good building to make fast of a wall with a couple of iron bolts, without mortar and teson joints—simply butt jointing?—NEBO.

(11777.)—**Rough Cast for External Work.**—I see at Eastbourne, Folkestone, and other Southern resorts, a rough cast of concrete and pebbles over a sort of rough-cast with half-timber or cement forming panels, and I should be glad if some correspondent from those places would kindly explain how this is executed, and with what materials, and whether it is used for weather-proofing walls or merely as decoration. The effect in some cases is very good.—EDWERT.

REPLIES.

(11783.)—**Decorations in Relief.**—Several excellent kinds of plaster-work have been used, the one made by Ripin Co., Fenchurch-street, mentioned last week, there are several kinds of compositions made of paper-moulded, cartonnage, that have been very largely employed for relief ornamentation for ceilings, decorations of interiors. The substance used must not only be of the right composition of setting, but must be tough, and not easily broken. Fibrous plaster compositions, in which glue or leather enters, are employed for the relief of ceilings and for the decoration of chimney-pieces, &c. Write to Geo. Jackson and Sons, Ltd., 10, Abchurch-lane, London, E.C. 4.

(11787.)—**Dilapidation Notices.**—You inquire of the Secretary of the Royal Institution of British Architects, he will give you a form.—EDWERT'S PARK.

(11788.)—**Crossed Strips for Stone Tiling.**—I have had several hundred square of new stone tiling set, but never with crossed strips. Formerly stone tiles were hung with oak pegs to cleat oak laths 1½ in. by ½ in. As the latter would be quite as cheap in many places as pine crossed, and very much better, why not use them? The oak pegs fall first, so that these might with advantage be replaced by concrete made by cement and sand, which is useful in some cases, but it should never touch the "weather" of any tile. Rendering proper would not do so; but if the tiles are bedded in mortar, and rendered so that rendering and bedding are in contact, then the mortar will take in rain. Stone tiles laid on to a sufficient lap, and rendered with concrete and rough sand, will keep out snow without injuring the strips—if no water comes in.

(11789.)—**The Abuse of Arbitrary Power by Architects.**—If what "The Victim" says is correct, that the architect withheld funds that were due, and made the architect's work, and made the architect's work, he would certainly have ground for claiming compensation. Of course, much will depend on the terms of contract, and the facts of the case.

(11790.)—**What is a Maisonette?**—A maisonette is not always a flat; it more correctly implies a divided dwelling, or one set of rooms in a house of two or more stories, provided, however, it has its own entrance floor, as being the more convenient form of construction.—X.

(11791.)—**What is a Maisonette?**—Maisonette is a small house. You will find it in Walter's Dictionary, published by Triebner, 1846.—ROBERT'S PARK.

(11792.)—**Geometrical Drawing Pen.**—An instrument for drawing geometrical curves, in which the movements of the pen or pencil attached to a revolving arm of adjustable length are varied by changing the radius of the curve. The pen or pencil is held in a holder, which is attached to the arm. The holder is a dictionary definition. Write to Stanley, the Mathematical Instrument, published by him and by Stanley, 10, Abchurch-lane, London, E.C. 4.

(11793.)—**Ellipsograph.**—Same work gives illustrations and descriptions of several. Possibly Finney's, or the Ellipsograph, which is a drawing instrument, the pen, they are expensive, as you will find.—ROBERT'S PARK.

The president and council of the Auctioneers' Institute will hold the autumn meeting at the Edinburgh next week, when a large gathering of the members is expected. After the business meeting on Friday next, the 13th, there will be a banquet at the Edinburgh Hotel, which will be taken by the president, Mr. W. Bennett Rogers.

The Duke of Clarence Memorial Church at Llanrhos, Llandudno, the memorial-stone of which was laid by the late Duchess of Teck in 1895, was consecrated by the Bishop of St. Asaph on Wednesday last. The church was designed by T. G. (Gerald) Scott, F.R.S., and has been built in sections, the channel, which has just been completed, being the gift of Lady Augusta Mostyn.

A large meeting of brickmakers and labourers was held at Farnham Green, Fletton, on Saturday evening last week, when Mr. A. Hynd was the recipient of a timepiece and bronzes, subscribed for by 350 workmen, and testimonials in which the great services in organising the Fletton and district branches of the National Union of Brickworkers and General Labourers. Mr. Emerson presided, and was supported by Mr. Hunt, president of the Peterborough Trades and Labour Council.

LEGAL INTELLIGENCE.

IS RE ALFRED GILBERT, R.A.—A first meeting of creditors under a receiving order against Alfred Gilbert, sculptor, of 16, Maids Vale, who presented his petition for a receiving order on 16th inst. was held on August 29 before Mr. H. E. Burgess, Assistant Official Receiver. The chairman said it appeared from the statements of the debtor that he had followed his profession for 24 years. From the year 1881, when he left Rome, until 1891 his income averaged £2,000 a year. In 1894 he was engaged by the executors of Sir Edgar Boehm to complete a group of statues for the purpose of the Queen's Jubilee. He received some remuneration, his income fell off in consequence of neglect of his own work. Afterwards he was encouraged to undertake big statutory work, and in the course of the year 1895 he was engaged by the executors of Sir Edgar Boehm to complete a group of statues for the purpose of the Queen's Jubilee. 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ILLUSTRATIONS.

TECHNICAL INSTITUTE, NEWPORT, MON.—EASTERN DISTRICT HOSPITAL, GLASGOW.—ST. MARY'S CHURCH, UPPER EDOMONTON.—COWLEY NASOR, GLOUCESTERSHIRE.

Our Illustrations.

TECHNICAL INSTITUTE, NEWPORT, MON.

THE designs were submitted by local architects for this institute. The one illustrated herewith was awarded the first premium by the assessor, Mr. S. B. Russell, and these plans have been adopted by the committee. A condition that the large hall and certain rooms grouped on the central boundary should be arranged as an extension has much influenced the plan. The building is arranged with the Art, Science, and Women's departments conveniently separated by distinct corridors and will incorporate the most recent improvements in regard to accommodation, fittings, warming, and ventilation. The technical subjects for which provision is made are:—Chemistry, physics, electrical science, mathematics, commercial and mercantile subjects, engineering, biology, carpentry, plumbing, bricklaying, plastering, and metal-work. The Art School, facing Clarence-place has north light throughout. Floors of Dean or Bridgton stone throughout and Whitland Abbey slates are intended. The boilers, engines, and dynamos for heating and power will be adapted for instruction and demonstration. Steam will be used to warm the building, ventilating radiators being placed in all rooms and corridors. The vitiated air will be extracted by a number of electric fans, any one of which can be set in motion when that particular section of the building is being used. It is proposed to spend £25,000 in the first instance. Mr. Norman M. Brown, A.R.I.B.A., of Newport, Mon., is the architect.

EASTERN DISTRICT HOSPITAL, DUKE STREET, GLASGOW.

THESE buildings, now shortly to be commenced, are the first of the three large new hospitals proposed to be erected by the Parish Council, Glasgow. The institution which we illustrate in this week's issue is intended for acute cases arising in the city. The site is a fine one, and comprises its special locality of the city, and comprises accommodation for 244 patients, divided into 133 males and 111 females. Wards are provided on the male side for 72 medical, 26 surgical, and 7 skin cases; on the female side, 36 medical, 25 surgical, 10 children, 7 skin, and 4 maternity cases; also for 16 maternal cases, 22 males, and 22 females. In addition there are provided wards for a due proportion of probationary and isolation cases in two blocks, fully equipped operating theatre, mortuary, post-mortem room, pathological laboratory, and also a large administrative block having the necessary offices for medical officer, steward, matron, the usual kitchen laundry, dispensing and general stores departments, with quarters for 30 nurses and 12 other members of the administrative staff. The general engineering installation, providing for the heating, ventilation, laundry, cooking, &c. will be of a very complete character. The architect of the work, Mr. A. Hessel Tiltman,

F.R.I.B.A., of Russell-square, London, says great difficulty was experienced in providing the accommodation in a reasonable and practical way owing to the very restricted character of the site. For this latter reason the architect has adopted the somewhat unusual form of wards radiating to one common centre, thus securing the maximum zone of aeration round each of the surgical and medical ward blocks, with the resulting economy of colours and staircases. The tidal system of wards, although unusual in England, is by no means unknown in Scotland, and it is largely adopted in Germany for its prisons and other of its large detention establishments. This system of planning was adopted by Mr. Tiltman in his design for the Glasgow Local Infirmary for similar reasons. Under such circumstances, ideal perfection of hospital planning is not obtainable, and the author only claims to have secured the best resolution of conflicting conditions arising from the disadvantageous shape and limited extent of the site. In this new hospital the architect has introduced many novel features, both in arrangement and appointment, some of them derived from the more recent German hospitals. The view illustrated to-day is from a drawing in this year's Royal Academy Exhibition.

ST. MARY'S CHURCH, UPPER EDMONTON.

THE proposed new chancel and chapel are designed by Mr. John Douglas, of Chester, to complete the church, originally from Mr. Wm. Butterfield's plans. The nave and aisle were built about twenty years ago; but the extreme poverty of the large working-class population, and the absence of interest in the parish of Chesham elsewhere, has hitherto prevented the completion of the church. The present design provides a handsome, dignified, and convenient chancel, a suitable side chapel, and a tower of uncommon character. Edmonton, once a quiet suburban village, is now a teeming suburb of some 50,000 working-class people. The old residents are gone, and it is much to be wished that such a completed church as St. Mary's could be provided for this neighbourhood. At the present time there is little probability of the works being commenced. Spacious vestries and new vicarage were erected on the south side of the church some years ago by the present vicar, the Rev. F. L. Ware.

ADDITIONS TO COWLEY NASOR.

THIS double-page illustration shows, by perspectives and plans, proposed extensive additions to the manor house at Cowley, Gloucestershire. The architect is Mr. R. A. Briggs, F.R.I.B.A., of Amberley House, Norfolk-street, Strand, W.C.

THE International Engineering Congress was opened on Tuesday at Glasgow, when over three thousand delegates were present. Mr. James Mansergh, the president, delivered his address, in which he dealt with the progress made in all departments of engineering, at the same time alluding to some of the causes which tended to check the electrical industry. Meetings were afterwards held in the various sections.

Mr. Arthur Rothwell, chief assistant engineer to the Radcliffe District Council, has been offered and has accepted a position as district engineer of public works in Ceylon. The salary attached to the position is 4,400 rupees (£300 per annum), with travelling allowances. Mr. Rothwell will sail from the Royal Albert Docks, London, on October 11. By the agreement Mr. Rothwell will serve in the public works department of Ceylon, and his duties will include the preparation of plans, estimates, and the supervision of the construction of railways, reservoirs, roads, sewers, drainage works, sewage disposal works, &c. Mr. Rothwell has been in the service of the Radcliffe Local Board and Urban District Council 8½ years.

THE estate has been valued at £389,883 19s. 9d. gross, including personality of the net value of £235,250 6s. 6d., of Mr. Alfred Heaver, of Oak Lodge, Upper Tooting, and of Holehouse Cottage, Wreckley, builder, who owned considerable freehold property in the neighbourhood of Clapham Junction, who was shot by his brother-in-law last month. He bequeathed to his manager, Mr. Alfred Heaver, who was at the time unable to continue his employment through illness or old age, an annuity of £1 4s. a week for the remainder of his life. After the payment of annuities to his wife, sons, and sister, the residue of the estate for a period of 20 years, and the trustees are to invest one moiety thereof in developing the trust estate and making advances to builders for the erection of houses and other property on land belonging to the testator.

COMPETITIONS.

DEATHS.—A large number of competitive plans have been received for the new Carnegie Public Library to be erected at the corner of Laidlaw-terrace and Bridge-street, and Mr. James Burnet, A.R.S.A., architect, of Glasgow, has this week been in Hawick examining these. Before finally announcing his award, we understand that he has taken four sets of plans to Glasgow with him in order that he may verify the measurements.

HAWKINS.—The two 25-guinea premiums in the competition for the new premises and alterations to their workshop at Herford, including new administration block and infirmary buildings, have been awarded to Mr. E. H. Lingen Barker, of St. Owen's-street, Herford, and to Messrs. Wills and Anderson, of Swansea. The other competitors were Mr. S. H. Eadus, of Wolverhampton; Mr. Arthur Marshall, of Nottingham; and Mr. R. J. McBeath, of Manchester.

LIVERPOOL.—The Housing Committee of the Liverpool City Council resolved on Friday to invite architects generally to send in competitive plans for the houses for the working classes to be erected in the Kew-street, Newsham-street, and Hurby-street area, and to offer premiums for the most meritorious plans.

CHIPS.

MR. W. O. E. Meade-King, an inspector of the Local Government Board, has held an inquiry at Brynmawr into the urban district council's application for sanction to borrow £8,000 for water supply improvements.

All Saints' Mission Church, Newton Abbot, was reopened on Sunday after renovation of the sanctuary. The walls have been decorated in light tones of green and cream, and new draperies and losses, by Messrs. William Morris and Co., of London, have been added, as well as a new oak table, executed by Mr. Hugh Mills, who carried out the whole of the work. A new classroom has also recently been added to the school, at a cost of £400.

At St. James's Church, Wolverhampton, on Sunday, the Rev. Canon Alexander D. V. Jackson, and placed in the tower of the church, was set in motion. The clock, supplied by Messrs. J. Smith and Sons, of Derby, will show the time on three dials, each 4ft. across, and the hours will be struck upon the church bell.

The Rev. Edward Lewis Cutts died on Tuesday at Trinity Vicarage, Havestock Hill, in his 78th year. Mr. Cutts wrote a number of books, including "Manual of Sepulchral Slabs and Crosses," 1849; and "Early Christian Art," 1892. He also contributed the volume on Colchester to the "Historic Towns" series.

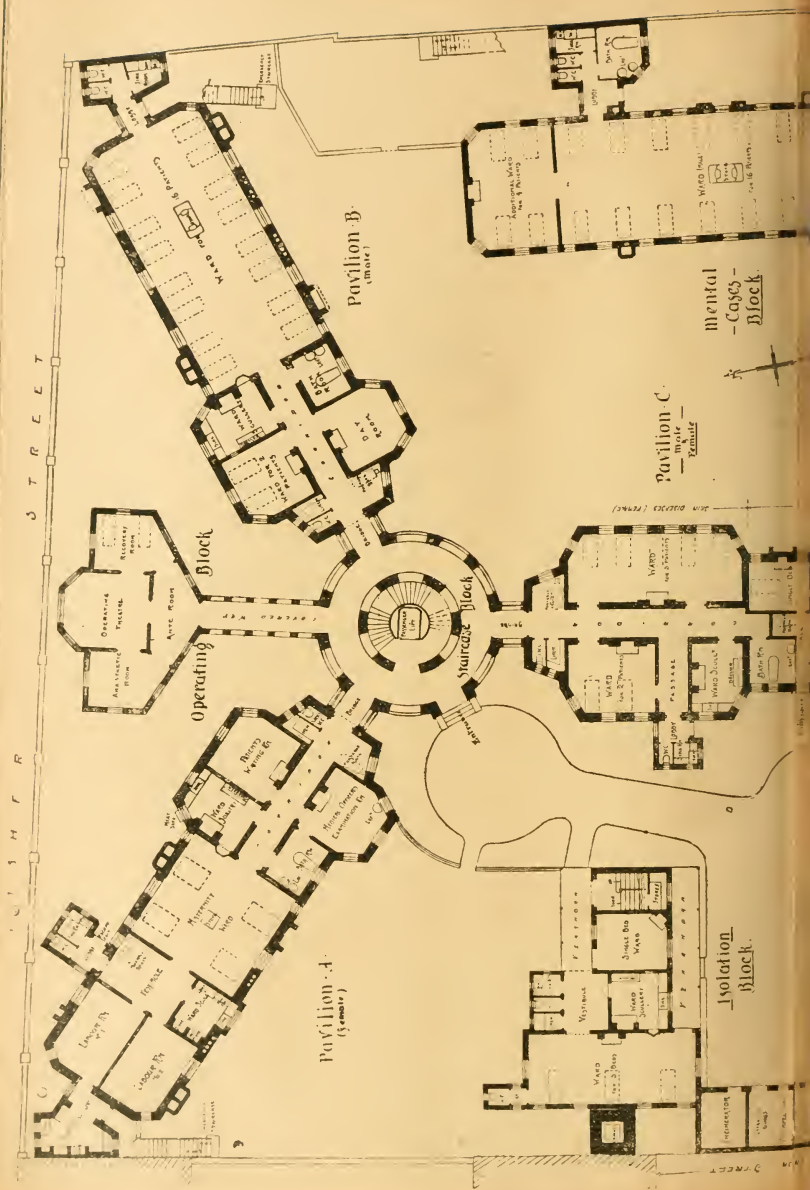
A new cattle market, provided by the corporation of Bodmin, was opened on Monday, the premises having cost about £2,000. Hitherto the market has been held in the streets.

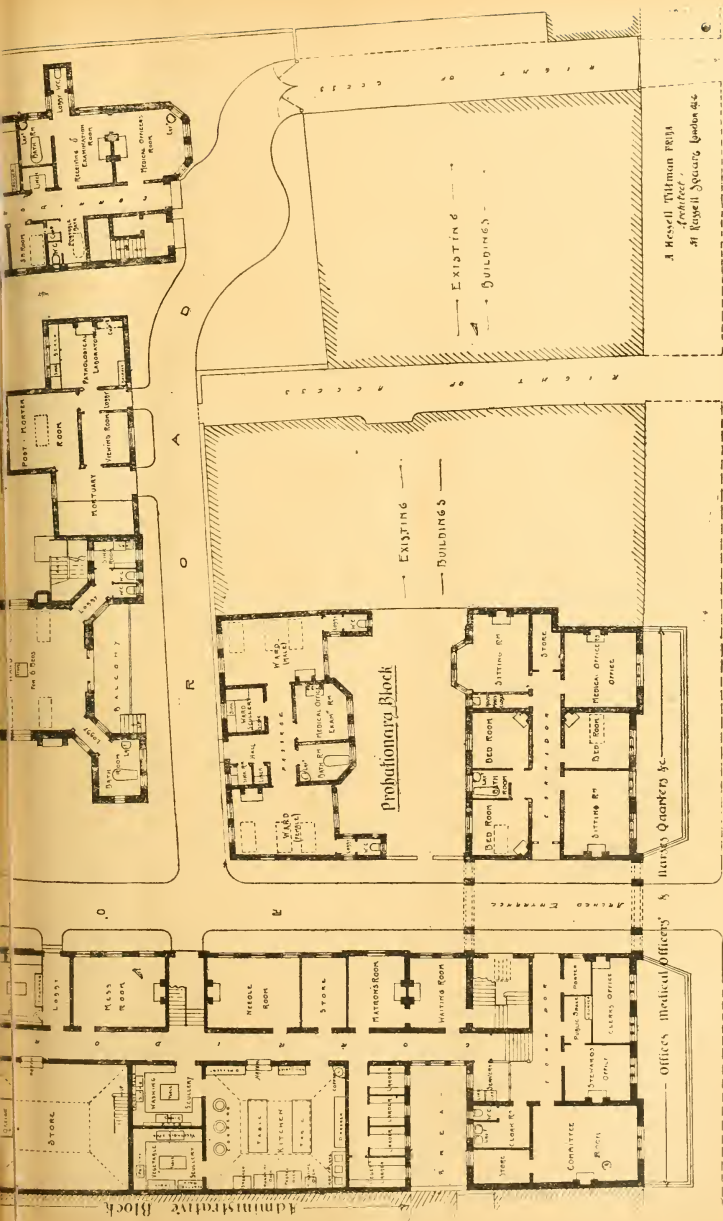
A meeting was recently held at Gainsborough to consider a request for enlargement of the church of St. John. A proposal to lengthen the nave by three bays, at an estimated cost of £2,500 to £3,000, was adopted. The vicar stated that Sir Hickman Bacon had offered to defray a third part of the total outlay, provided the £1,500 was obtained in addition.

The Viceroy of India will open the Mandalay Canal during his approaching visit. This canal, the largest and only work of its kind undertaken in Burma, was commenced in December, 1899, and will cost over Rs. 32 lakhs. It is 30 miles long, and distributaries aggregating 85 miles, and is calculated to irrigate 72,000 acres. It takes off from the Madyaya River and runs through the Mandalay district.

Gratifying progress is being made in the building operations at Truro Cathedral. Last week the cross that completes the western gable of the nave was placed in position. After a blessing had been asked on the stone, it was raised and fixed under the superintendence of Mr. Price, the clerk of the works.

The monument to the memory of the late General Sir Wm. Penn Symonds, now in course of erection in the Victoria Gardens, Saltash, will be built of granite from the quarries of Cornwall, surrounded by a carved cornice heavily gilded, and at the base will be empanelled a bronze medallion bust of the late general, designed and executed by Mr. Drury, A.R.A., and will be surrounded by the names of the memorial. Mr. Bolt, who contracted for the monument and the erection, died a few weeks ago, and the completion has been carried out by his sons. The memorial will be dedicated by the Earl of Mount Edgemoor on Monday week, Sept. 15.





D U N E J T R E E T

EASTERN DISTRICT HOSPITAL, GLASGOW. A. HESSELL TITHMAN, F.R.I.B.A., Architect.

WATER SUPPLY AND SANITARY MATTERS.

HUIDENSFIELD.—LEAKAGE OF A RESERVOIR.—The condition of one of two large reservoirs in the course of construction for the Huddersfield Corporation in Wessenden Valley—that known as the Butterley Reservoir, which is rapidly nearing completion—has given rise to some anxiety among ratepayers. The late Mr. Huddersfield, who has been dead, inquires reveal the fact that a leakage of 100,000 gallons every 21 hours has been discovered. The work of construction has been going on for a number of years, and the leakage is due to the failure in the last monthly report to the town council, the cost of the undertaking so far has been £28,785. This leakage is taking place with a depth of 14 ft. of water, and whether it will increase in the event of the reservoir being full is doubtful. The engineers, Messrs. Hawkesley of London, and Crowther of Huddersfield, have reported to the waterworks committee that there is no danger. It has been ascertained that, as far as the construction works are concerned, there is not the slightest flaw, and that the water escapes through natural stratification at points where it had been feared water might pass. In order to remedy the leakage two proposals have been made, but in neither case will the existing works have to be interfered with. It is currently reported that the estimated cost of remedying the evil, whichever scheme is adopted, will be about £50,000.

An important char-*h* extension scheme is being carried out by the Presbyterians at West Kiburn. It is proposed to erect a church to seat 700, and the cost, including classrooms and other accommodation, will be about £5,000.

A special meeting of the Malton Rural District Council was held on Saturday to further consider the schemes of water supply for Singsby and the street villages. Two schemes had been considered by a committee—namely, to procure water from Hougham and neighbourhood, known as the Wath Beck scheme, and the other from near Gilling, called the Blacklake Plantation scheme. The former would yield 90,000 gallons per day, and cost £7,002 15s. 9d., and the latter 30,000 gallons at a cost of £8,291 15s. 7d. The committee recommended the less costly or Wath Beck scheme, and the council adopted this.

A correspondent, writing on the subject of small churches, says:—The smallest complete ancient church, consisting of nave and chancel is that of Culbone, in Devonshire, which ought to be about 11 ft. by 12 ft. St. Lawrence, in the Isle of Wight, used to be the smallest—2 ft. by 11 ft.—but it has been enlarged in recent years. The chancel of Lullington, Sussex, which, like the nave, has been destroyed (according to tradition) by the Puritans in Cromwell's time—is 16 ft. square.

The foundation-stone laying of the Northumberland and Newcastle-on-Tyne Waterworks at East Chevington, Broomhill, took place on Saturday. The land on which the houses are to be built was given by Earl Grey, and covers an area of 1,400 square yards. The cottages, ten in number, will be self-contained, with two rooms each, and yards with the usual out-offices, and a garden plot in front. These will be finished within four months.

The London County Council has, with the approval of the Board of Trade, under the Merchant Shipping Act, framed new laws for the better of seamen's lodging-houses, which ought to be a long way towards improving the lot of the sailors while ashore, so far as London is concerned. The by-laws provide that such houses, when being licensed, and that fact must be prominently exhibited, together with a fixed scale of charges for board and lodging, which cannot be exceeded.

The American Public Health Association will hold its twenty-ninth annual convention in Buffalo on Sept. 10-20. The delegates will be at the Niagara Hotel, and the meetings at the Seventy-Fourth Regiment Armory, one block away. Among the topics for general discussion are the Pollution of Public Water, the Disposal of Refuse Material, and the section on Bacteriology and Chemistry will consider, among other subjects, standard methods of water analysis.

The proposal to do away with the old wooden bridge between the Albion and Whitechurch, and to replace it by an iron one, has raised a strong protest on the part of those who wish to preserve the picturesque of the Thames scenery, and it is hoped that the protest in this case may be as successful as was a similar one in the case of the reference to an old wooden bridge crossing the river at Hurley.

The contract for the southwards for the Stewart Street Station and all the sub-stations in connection with the electrical supply system has been let by the electricity committee of the Manchester Corporation to an electric company in Berlin. The cost of the contract is not far short of £30,000.

STATUES, MEMORIALS, &c.

CORTACHY, N.B.—The laying of the memorial-stone took place on Saturday of the massive tower which will be the nucleus of the new Cortachy, the Cortachy, for some months, to the memory of the Earl of Arlie, who fell mortally wounded while gallantly leading the charge of the 12th Lancers, at Diamond Hill, near Pretoria, in June of last year. From a design by Mr. T. M. Cannon, architect, Dundee, the tower is modelled on the lines of the old Border beacon or warning tower. It is Scottish Baronial in style, with something of the character of the West Coast of Scotland. The recent Lord of Cortachy, and is intended to be used, with its single platform and beacon, on occasions of national or estate rejoicings. The foundation consists of a platform formed round the base of the monument with large boulders taken from the hill, while the base proper is set apart for telling the story of the life of the late Earl and his military services. In the base are placed carved panels representing the arms of the Arlie family, with inscriptions and the badges of the regiments in which the late nobleman served—viz., the 12th Lancers, the 10th Hussars, the 8th Scots Guards, and the 11th West Yorks. Rising to a height of 65 ft. upon an eminence 1,250 ft. above sea level, and costing £1,300, the monument is visible not only throughout the whole valley of Strathmore, but also Perthshire, Fife, and Kincardineshire as well.

CHIPS.

The City and South London Railway Company will open their extension from Moorgate-street to Islington in time to take visitors to the annual Cattle Show at the Agricultural Hall.

At the quarterly Court of Governors, of the Middlesex Hospital it was decided to expend £11,500 in the erection and equipment of a laundry at Hendon.

The new buildings for the Radcliffe Library at Oxford, which have been presented to the University by the Drapers' Company, were formally opened by the Earl of Derby. The buildings, which cost £21,000, and have been erected from designs by Mr. T. G. Jackson, R.A. They form a projecting wing of the museum, with which its Renaissance architecture is in strong contrast. They consist of two upper floors, the lower 80 ft. in length, fitted up as libraries with all accommodations for readers, as well as a basement for the storage of books. There is room, it is calculated, to serve for the accommodation of a century to come.

The clubhouse of the Wimbledon Park Golf Club, erected eighteen months ago, at a cost of £7,000, was totally destroyed by fire on Friday afternoon.

In October last the foundation-stone of the Liverpool Sanatorium for consumptive cases was laid by the Earl of Derby. The structure, which is at Kingswood, in Delamere Forest, is on the eve of completion, and will be ready for the reception of patients on Monday next. Messrs. Willink and Thicknesse, of Liverpool, are the architects, and Messrs. J. Gerrard and Sons, of Swinton, near Manchester, the contractors.

The visit of Mr. W. H. Long to Hull for the purpose of opening new streets planned by the city council is fixed for Oct. 24.

The workhouse at Wayland, Norfolk, is about to be enlarged and improved, and plans by Messrs. Morgan and Buckingham, of Norwich.

Mrs. Sophia Jane Clifton, the widow of Mr. Edward N. Clifton, architect and surveyor, East India-avenue, E.C., died last week at her residence at Banstead.

Damage estimated at £7,000 was caused by fire on Friday night to the works of the Army, Navy and Royal Co., Glasgow. Germaine Bridge and Roof Works, Glasgow, were also destroyed by fire late on Wednesday night. The damage in this case likewise estimated at £7,000.

Mr. N. W. Hare, M.P., formerly opened at Lanchester on Saturday the new F.S.A. institution which has been erected for the Centenary Brotherhood by the trustees of the Centenary Congregational Church, at a cost of £5,000. The building is a fine one, built to seat about 600 people, reading, recreation, committee, and billiard-rooms.

At a cost of £5,000, a new lifeboat, house, and slipway have been provided at Cokerack, not far from the dread Mandies. The boat was launched on Friday last by Lady Jane Vivian.

The painting of Smithfield Central Markets is proceeding apace, the cost of the undertaking being over £300,000. Some six years ago the markets were painted, and this year a slight alteration will be made in the colour, as the exterior will be painted a darker shade. The work is now being done by the contractor is Mr. W. Dudley, Lower Thames-street, E.C.

Operations were conducted at the Mart on three days last week, the supply causing a number of investments in houses and shops in the suburbs, agricultural land in Hampshire, and building plots at Herne Bay and in Essex.

Capt. W. O. Douglas, who died at Basingstoke, N.H., on August 16, was the patentee of the Douglas portable draw-bridge, which has been largely adopted in New England and the Eastern States.

Good progress has been made with the breakwater and defence works at Portland, but it is not expected that the former will be completed by the contract time, which expires in about a year. The breakwater is well above water, and at low-water the magnitude of the work accomplished can be seen. Important alterations in the general defences of the island are in contemplation, and a large sum is to be expended on the development of the coaling facilities.

Mr. James Diggle, formerly of Heywood, has been appointed surveyor to the urban district council of Matlock. He is presently surveying Ashton-on-Mersey. There were 91 applicants for the Matlock post.

Lord Avebury has fixed Tuesday, the 24th inst., as the day on which he will lay the memorial-stone of the new technical school at Southend-on-Sea.

The foundation-stone of a new Wesleyan Chapel will be laid on Wednesday at Wellesley. The building will be built of brick, faced with red pressed brick facings and tiled roof. There will be half-timber work in the gables, and in the windows cathedral red bricks, the lower portion to be completed in red bricks. There will also be a small vestry. The accommodation is for about 110, and inside the decorations will be plain. Mr. A. W. Smith, of Maidstone, is the architect, and Messrs. Ellis and Son are the contractors.

On Wednesday week a combined meeting of the members of the St. Albans and Hertfordshire Architectural and Archaeological Society was held at Hitchin, when some of the principal objects of interest in that picturesque town were inspected. At the parish church papers were read by Mr. Walter Millard and Mr. T. Geoffrey Lucas, while Mr. G. Aylott described the Biggin Almshouses, which occupy a site of a Gilbertine monastery some 1,000 years old.

The Local Government Board have sanctioned the loan of £32,500 to the Lowestoft Town Council for sea-defence purposes, the money to be repaid in thirteen years.

The new St. Pancras Bazaar in Prince of Wales-road, Kentish Town, is to be opened on Wednesday, October 10, by Mr. Stephen Blundell, M.P., Bart., M.P.

On Wednesday week a Local Government Board inquiry was held at Muncieley by Colonel A. J. Hepper, D.S.O., R.E., into the application of the Eppingham Rural District Council for sanction to borrow £1,250 for works and sewerage in the parish of Muncieley. Mr. J. Inglis, civil engineer for the scheme, explained the proposals.

A new theatre is to be built for Glasgow at the south-west corner of Elmbank-street and Bath-street, at present used as a yard for the storage of building material. The plot is bounded by Elmbank-street, Bath-street, near Charles-Cross. The theatre is to be ready for occupation about the autumn of next year, and the cost will be between £30,000 and £40,000.

Tenders are invited for works in connection with a large water supply scheme in Calcutta, including the construction of the coffer dam, the masonry of the lock and the aqueduct, but not comprising masonry work. The cost of the works is estimated at £50,000. Tenders should be addressed to the Engineer-in-Chief, a Bungalow near Me up to 4 p.m. on the 20th inst. The final adjudication is expected to take place about the end of October.

A commencement was formally made on Tuesday last of the interesting undertaking of the Tees Valley Water Board, when the members of that authority journeyed to Longnewton, some ten miles from Middlesbrough, for the purpose of witnessing the construction of the new reservoirs. The Board, under the leadership of Mr. R. H. Hind, and Mr. W. Anderson, of Thornaby, sat the first of the two reservoirs the board are about to construct there is a cost of £117,000. The new reservoirs are each to be 100 yards long, 160 yards wide, and 17 ft. deep, and will hold together some 200,000 gallons of water. The top water of the reservoirs will be about 160 ft. above the Middlesbrough Market Place. The contractor is Mr. J. Smith.

Mr. James Perry and his glass and mirror manufacturers, His Majesty's optician, of South-street, W., have received instructions to restore the more important chandeliers of Windsor Castle. Several of them were made at this firm for Carlton Palace about 1870, and were at the time in the possession of, and they are now being renovated to the original designs.

Our Office Table.

It has been definitely decided by Mr. Akers-Boulds, the First Commissioner of Works, acting at the recommendation of Viscount Epsom, the secretary to this department, that the responsible task of completing the new Government offices, designed by the late Mr. J. M. Brydon, shall be carried out by Mr. Henry Tanner, R.I.B.A. (the designer of the General Post Office, &c.), under the supervision of Mr. J. C. K. Consulting Architect to the department, and arrangements have this week been completed for relieving Mr. Tanner of his ordinary duties as chief of the architectural staff at H.M. Office of Works. The drawings left by Mr. Brydon are in a very incomplete state, and the plans and main elevations were shelved, and have, indeed, been illustrated on our pages, while rough $\frac{1}{16}$ in. scale pencil sketches exist, showing the proposed mouldings and other details. As has been mentioned in the daily Press, the design has been paid for, and the executors of the late Mr. Brydon have received the sum of £10,000. The remainder of the sum set aside for "commission"—another £6,000 or so—will be employed—as it would have been by Mr. Brydon had he lived—in remunerating the subordinates who will have to carry out, from day to day, over six or seven years, the work of variation and superintendence.

At St. Paul's Cathedral, the workmen have been downed, repaired, and refitted one of the large and original lead water pipes which Sir Christopher Wren placed in shafts constructed within the massive walls of the building. The shafts are in some places no less than 20ft. thick, and Wren made in them a series of shafts—3ft. x 2ft. in size, the primary purpose of which was to carry off the rain-water from the roof. With such a small and large leaden pipe, Sir Christopher Wren placed in shafts, reaching from the roof right down to the crypt; and it is one of these which has been taken down, repaired, and replaced—a slight task, when the size and length of weight are considered. The shafts are also in places so dangerous that men can ascend on their workmen, in odd corners of the shaft, to the roof, without rearing a ladder outside.

A "GREATER BATH" is to be created, the city council of Bath having this week adopted the report of the City Boundaries Extension Committee, which stated that the time had arrived for the inclusion within the city of the more populous parts of the adjacent parishes. They declared that the whole of Twerton and parts of the parishes of Weston, Charlcombe, Wainswick, Bathaston, Bathford, Bathampton, lawerton, and Monkton Combe should be included. It was essential particulars should be obtained as to area, population, rateable value, debtlessness, present condition, and mileage of the area, and the roads contributing from the county council, police, lighting, sewerage, and general sanitary condition of the area. The committee was authorised to pursue these inquiries, and £300 was voted towards the estimated preliminary expenses. The action of the city council has doubtless been hastened by the revelation in the census returns of a marked increase in the population within the existing municipality boundaries, and a corresponding growth in density of inhabitants in the areas now sought to be included.

Mr. W. H. BANNER offered for sale at the 10th Stafford Hotel, Stoke-on-Trent, on Tuesday, the going concern, the business, goodwill, and all material, designs, plant, and machinery, and other property connected with the tins, earthenware, and tile works known as Jinton's (Limited), together with the lease of six three manufacturing at Stoke-on-Trent and six brick showrooms, offices, and warehouses. The offer included the right to change the name of the business, and the business was established in 1878, and the productions of the firm have, of course, a reputation of the first order throughout the world. The concern is in full work, and Mr. Banner told the company, it is seldom that the number of the auctioneers, the number of the sale was that the business should not be moved from the present premises of the landlord about his written consent, but it was stated that arrangement might be made for acquiring a few simple of the premises at Stoke. Another condition was that the purchaser should purchase

chase at valuation the stock-in-trade, &c., and, this, in reply to a question, it was stated was at the last stocktaking returned at about £54,000. The latter condition created some comment, and no offer being forthcoming a gentleman present stated that he would be prepared to make one if the conditions referred to were withdrawn. Mr. Banner, however, replied that they could not alter the condition, and the company dispersed without any bid having been made.

For the protection of the copyright in Ordnance Survey maps, the following notice is published in the *London Gazette*—"Printers and publishers are hereby warned against making use of Ordnance Survey-maps in such manner as to infringe the copyright therein, and also against the use, upon or in connection with any map (not being an Ordnance Survey map), of any words or description which would induce the belief that such map is produced, or issued by, or under the authority of, or in connection with, the Ordnance Survey Department. Any person desiring to utilise in the production of a map the information obtained by the Ordnance Survey Department and published by the Ordnance Survey, should apply to the Controller of His Majesty's Stationery Office for permission to do so. The Controller will take such proceedings as he may be advised, in the case of any map constituting an infringement of the said copyright, and published without such permission, for the enforcement of the copyright; and in the case of any improper use of such words or description as aforesaid, for the protection of the exclusive right to use the words 'Ordnance Survey' upon or in connection with maps."

The Ruskin Memorial Museum at Coniston was, on Saturday afternoon, opened by Canon Rawnsley. The museum takes the form of a plain room, 30ft. square, at the rear of the Coniston Institute, but it is so neatly fitted up to place the paintings, sketches, and works of Ruskin to the best advantage. The north side of the room is devoted to the exhibition of natural history relics, and to engravings and views of Ruskin's homes, after Arthur Severn, R.I. The south wall is hung with pictures of local interest, and others illustrating Mr. Ruskin's writings. The east portion contains drawings by Ruskin, Greek relics dug up in Cyprus, Ruskin MSS., in chronological order (lent by Mr. and Mrs. Severn), whilst the opposite wall is completely covered with pictures and examples by Ruskin, including very large lecture diagrams, and a series for his work "Stones of Venice," representing his style at various periods of his life from the maps of early boyhood to his latest sketches of sunset effect, as seen from the study windows at Brantwood.

A SEVERE indictment of "model blocks" of flats appears in the report just issued by Mr. D. Cubitt Nichols and Dr. Edward Saxon as to a public inquiry held by them, by the direction of the Home Secretary, into the sanitary condition of certain premises in the parish of St. Leonard, Shoreditch. They say:—"In the course of our inspection we visited many of the so-called model blocks of dwellings built on the flat system. To say that some of these model blocks are built without due regard to sanitary requirements would be a mild understatement. The fact is that they are built in gross violation of the very first principles of sanitation. We may draw attention to some blocks of dwellings at Shoreditch which illustrate our meaning in a striking manner. Here will be found buildings on the flat system over 40ft. high, and less than 20ft. apart, containing large numbers of separate dwellings, approached by dark corridors. The water-closets for these dwellings abut on the corridors, and are without direct light or proper ventilation. The dwellings thus approached contain rooms, many of which can never be penetrated by the rays of the sun, and the dark, gloomy habitations are, in our opinion, far more likely to become a source of danger to the public health than are even the worst of the dilapidated cottages to which public attention has been drawn by the Mansion House Council."

The members of the Gas Institute, who are holding a conference at Glasgow this week, are making an inquiry as to the possibility of Edinburgh and Leith Gas Commissioners to sit down to a banquet held under the crown of the new gasometer in course of erection at Granton. Two hundred guests assembled in the gasometer, which has a diameter of 250ft., and formed of 30ft. lifts on the telescopic principle, rising to a height

of 120ft. above the level of the tank. It is being constructed for the gas commissioners by Messrs. Clayton, Son, and Co., Ltd., of Hunslet, Leeds, who have also laid down the whole of the new plant at the works, including retort-house 386ft. in length by 100ft. high. The gas-holder, which will be the largest in Scotland, is rapidly approaching completion. It will, when full, have a capacity of six and a half millions of cubic feet. Two thousand tons of steel have been used in its construction.

The Clergy and Artists' Association for the improvement of art in churches will hold their sixth annual Church Congress exhibition in the Pavilion, Brighton (by permission of the committees of the Pavilion and the Church Congress) during Congress week. The great feature, as before, will be the exhibition of the personal work of artists working independently in churches, and will include, in addition to examples of work executed under the auspices of the association, a representative collection of the work of individual artists working in churches. Artists wishing to submit work may do so on addressing the secretary by letter at the offices, 6, Millbank-street, Westminster, S.W., up to September 21. The committee are glad to consider any work of suitable design, direction, and feeling. The hon. secretary writes that a list of work in churches throughout the country and the colonies executed through the association during the six years of its work is being prepared, and will be sent to any person desirous of information from the offices of the association.

MEETINGS FOR THE ENSUING WEEK

SATURDAY (TO-MORROW).—Architectural Association Summer Visit to Wakehurst Place, Ardingly, Sussex, by kind permission of Sir Thomas Boscawen Bart. Members to meet in the Main Line Booking Office, Victoria Station (L. B. & S. C. Ry.), at 10 p.m. for the 1.40 train to Ardingly.

MONDAY.—Clerks of Works' Association, Carpenters' Hall, London Wall. Monthly Meeting, 7.30.

The Society of Architects.

Founded 1884. Incorporated 1893.

AN EXAMINATION to qualify for MEMBERSHIP will be held on Oct. 8, 9, and 10, 1901, at ST. JAMES'S HALL, PICCADILLY, W. Entries close Sept. 25th. Syllabus free. Post Examination Papers Two shillings.

C. MCARTHER BUTLER, Secretary,
Society of Architects.

CHIPS.

The additions to the grammar-school, Pontefract, are being warmed and ventilated by means of Shorland's patent Manchester grate, which is a perfect extract ventilator, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The exterior of the Royal Exchange is in the hands of the decorators and painters. The great clock is being subjected to a thorough overhaul by Messrs. Mansfield and Son, of Upper Thames-street, and the gashopper, which acts as a weathercock, is 14ft. in length, and is being regilded after a lapse of ten years.

The partnership hitherto subsisting between Messrs. E. J. Billington, G. Bennett, and J. Lomas, builders, &c., of 17, Great St. Andrew-street, Westminster, S.W., under the style of Billington, Bennett, and Lomas, has been dissolved so far as regards Mr. E. J. Billington.

The urban district council of Windermere have instructed Messrs. Beesley, Son, and Nichols, civil engineers, of Westminster, to prepare a scheme for the sewerage and sewage disposal of the town.

The new Temperance Hall erected in Princess-street, Huddersfield, was formally opened on Saturday by the Mayor. The building has cost about £5,000, and the ground is leased from the Ramsden estate. In the evening, a performance has followed, the architect being Mr. B. Stocks, of Huddersfield. The principal hall will seat 650 persons, and there are two large clubrooms, besides other apartments and offices.

Mr. M. K. North, A.M.I.C.E., one of the inspectors of the Local Government Board, held an inquiry at the town-hall, Newcastle-on-Tyne, on Tuesday, into an application made by the City Council to the Local Government Board that sanction should be given to a scheme for the erection of dwellings for the labouring class. The Corporation, under the provisions of their Tramways and Town Improvement Act of 1899, proposed to purchase or acquire a number of houses occupied by people of the labouring class.

LIST OF COMPETITIONS OPEN.

Black-pit-Laying-out Land at Censery	£20, £15, £5	The Borough Surveyor, Town Hall, Blackpool,	Sept. 1
Charles, S.W. - Public Baths, King's-road	100gs, merged, 50gs, 30gs.	The Public Baths Committee Office, 171, King's-rd., Chelsea, S.W., Oct. 1	
Camberwell, S.E. - Halls and Washhouses, Old Kent-road	150gs., 75gs., 50gs.		
A. Saxon Spill, F.R.I.B.A., Assocn.			
London, S.W. - Hearts of Oak Society's New Offices, &c.	£100 merged, £75, £50	Sidney R. J. Smith, F.R.I.B.A., 11, York Buildings, Adelphi, W.C., Nov. 15	
80, Peter Port, Guernsey	£100 merged, £75, £50	The Rev. G. H. Lee, Rector, Peter Port, Guernsey	
Watlington-Thames - Municipal Buildings, Fire Station, &c.	£20, £20, £10 10s	P. M. Webb, U.D.C. Clerk, Walton-on-Thames	
Cardiff - Chapel, Cathedral-road, cost £2,000		Thomas Evans, 102, Cathedral-road, Cardiff	

LIST OF TENDERS OPEN.

BUILDINGS.

Rugby - Slaughter-Houses, &c.	Urban District Council	D. G. Macdonald, A.M.I.C.E., Surveyor, Rugby	Sept. 1
Abertillery, Wales - Police Station, &c.	Glamorgan County Council	T. Mansel Franklin, Clerk, Westgate-street, Cardiff	
Great Harwood - T.M.F.C. Schools, Windsor-road	Seaport Parish Select Vestry	W. H. Dinsley, Architect, Cleveland-street, Chichester	
Rainville - School-house, &c.	Corporation	Thomas Larnour, Hon. Sec., Drumson-street, Harrogate	
Aberdare - Additions to Sirialb Welsh Independent Chapel	Co-operative Society	T. Roderick, Architect, Ashbrook House, Aberdare	
London - Isolation Hospital	Iron and Coal Co., Ltd.	Geo. C. Kent, Town Clerk, Court House, Longton	
Weymouth - Slips and Moors, High-street	Corporation	H. H. Jackson, Architect, High-street, Weymouth	
Aber - Additions to Dantef Hotel	Glamorgan County Council	Arthur O. Evans, Architect, Pontypool	
Leeds - Forty-Six Houses, Auchterdermain-road	Corporation	John Hoston, Architect, Dunderdale	
Cleary - Wesleyan Church, King's-road	Urban District Council	A. V. Lambert, Architect, 22, Park-st., Nottingham	
Ton Centre, Wales - Police Station	Urban District Council	T. Mansel Franklin, Clerk, Westgate-street, Cardiff	
Edinburgh - Public Washhouses, Allan-street	Urban District Council	Robert Morison, City Architect, Edinburgh	
Preston - Chimney Shaft 100 ft. high, Royal Infirmary	Urban District Council	F. E. Dixon, C.E., Architect, 45, Lane-street, Preston	
Southborough - Cemetery Chapel and Cottage	Urban District Council	William Harner, Surveyor, 187, London-road, Southborough	
Belbroughton - Stable, 100 ft. long	Urban District Council	T. S. Longstaff, Surveyor, 1, Castle-street, Nottingham	
Hilwell - Revolving, &c., Hickley Farm	Urban District Council	Samuel Sagar, Architect, Newton Abbot	
Durington - Residence and Conservatory, Grange-avenue	Urban District Council	Frank Martin, Architect, South End Chambers, Durington	
St. Albans - Court, 100 ft. long	Urban District Council	Samuel A. Smith, Clerk, 1, Parliament-street, S.W.	
Aberdare - Swimming-Baths at Public Park	Urban District Council	The Surveyor, Town Hall, Aberdare	
Cwmavon - Two Vestries at Wesleyan Chapel	Urban District Council	G. E. Frosser, Cwmavon	
Solihull - Store and Office Block at Asylum	Urban District Council	W. Croxall, A.M.I.C.E., County Surveyor, Shire Hall, Durham	
Ringley - Covered Market	Urban District Council	H. Bottomley, Surveyor, Town Hall, Ringley	
Ulverston - Improvements at High Bridge	Urban District Council	The County Bridgemen's Office, Preston	
Lincoln - Public Abattoir	Urban District Council	A. N. Macdonald, County Surveyor, Corporation Offices, Lincoln	
New Wortley - Cemetery Greenhouse, &c.	Urban District Council	H. Williams, Superintendent, New Wortley	
Bristol - Stable, Lawrence-hill	Urban District Council	G. K. Mills, Secretary, Paddington Station, W.	
Kilkeel - Cusque Station	Urban District Council	A. Ferguson, Insurance Buildings, Donegal-square, West, Belfast	
Claydon - Ten Zinc Archimedean Ventilators at Workhouse	Urban District Council	J. E. Helmsley, Clerk, 4, Town Hall-street, Bradford	
Manchester - Two Chimneys 250 ft. and 200 ft.	Urban District Council	K. S. Allott and Son, Engineers, 45, Brown-street, Manchester	
Wimborne - Novelty Floor to Swimming Bath	Urban District Council	J. M. S. Kell, Clerk, 1, High-street, Wimborne	
Glasgow - Warehouses, &c.	Urban District Council	J. M. S. Kell and Sons, Architects, 68, West Regent-street, Glasgow	
Oxley - Marsh - Repeating Bridge	Urban District Council	County Surveyor, 1, Corporation Office, Preston	
Flint - Additions to Iron Congregational Church	Urban District Council	H. Whicker, 23, Holborn-street, London	
Stockton-on-Tees - Raising Workhouse Chimney Stack, &c.	Urban District Council	C. Lyman, Architect, Stockton-upon-Tees	
Norton, Yorks - Repeating Bath	Urban District Council	William Bottomley, Clerk, 1, Corporation Office, Norton, Malton	
Tantolish - House and Shop	Urban District Council	T. D. Wilson, Architect, 21, Durham-road, Blackhill	
Newbury - Classroom at Inkpen Park School	Urban District Council	W. Bell, Architect, Market-place, Newbury	
Lower Sydenham - School, 100 ft. long, 100 ft. wide, 100 ft. high	Urban District Council	The Surveyor, Town Hall, Newbury	
Stone, near Aylesbury - Additions to County Asylum	Urban District Council	R. J. Thomas, A.M.I.C.E., Surveyor, County Hall, Aylesbury	
Penzance - Church and School, Alexandra-road	Urban District Council	The Rev. M. May, Finland House, Penzance	
Brickton - Forty Four-roomed Artisans' Dwellings, Dewar-d.	Urban District Council	Henry Little, County Surveyor, 1, Corporation Office, Preston	
Halifax - Shops, &c.	Urban District Council	H. Faraday Proctor, City Electrical Engineer, Temple Back, Bristol	
Lewisham, S.E. - Shed, Milesworth-street Depot	Urban District Council	C. C. Hope and Son, Architects, 25, Bank-street, Bradford	
Chichester - School, Castle-avenue	Urban District Council	F. C. May, M.L.C., Borough Engineer, Town Hall, Brighton	
Overland - Warehouse and Offices	Urban District Council	Joseph F. Walsh & Graham Nicholls, Museum Chambers, Halifax	
Llanelli - School at Trecy	Urban District Council	The Surveyor, Town Hall, Cardiff	
Bradford-on-Avon - Raising Roofs of Cottages	Urban District Council	Robert and Gressall, Architects, Victoria Chambers, Colechester	
Llanfairfach - Business Premises	Urban District Council	J. J. Walsh and G. Nicholls, Architects, Museum Chambers, Halifax	
Hetton Down - Farmhouse	Urban District Council	J. Davies and Son, S.A., Cowell House, Llanelli	
Lincoln - Boiler-works, &c.	Urban District Council	Richard Davies, Architect, 125, High-street, Bangor	
Perth - Houses for Working Classes	Urban District Council	Wm. and T. R. Milburn, Architects, 20, Fawcett-street, Sunderland	
Pocklington - Rebuilding Farm Premises	Urban District Council	Burton, Proctor, and Co., Shed Ironworks, Lincoln	
Peterhead - Police Station	Urban District Council	M. K. Millop, Borough Surveyor, 10, Tay-street, Perth	
Boughton Regis - Additions to Upper School	Urban District Council	C. F. Chambers, 39, Corporation Office, Burnley	
Puddington, W. - Mortuary Buildings, &c., Manor-place	Urban District Council	Joseph Bentley, County Surveyor, 7, Lower-street, Kendal	
Mansfield - Littlewood Schools 9000 places	Urban District Council	J. R. Brown and Son, Castle-street Chambers, Luton	
Puddington, W. - Mortuary Buildings and Chapel	Urban District Council	The Surveyor's Department, Town Hall, Puddington, W.	
Newcastle-upon-Tyne - Rebuilding School	Urban District Council	V. Vallance and Westwick, Architects, Mansfield	
Wolsley - 178 Cottages and 22 Villas	Urban District Council	The Surveyor's Department, Town Hall, Puddington, W.	
Pontilich - Two Houses	Urban District Council	W. Dowdell, Architect, John-street, Treherism	
Kirkcubbin, Huddersfield - Asylum	Urban District Council	Wm. Davies, Architect, Pontilich	
Birmingham - Two Cottages and Farm Buildings	Urban District Council	Vickers, Edwards, and Co., Architects, Wakefield	
Crumlin, Mon. - Additions to Huddersfield Inn	Urban District Council	R. L. Roberts, Architect, Abercromby	
London, S.E. - Works at Hotten Extension, Princess-road	Urban District Council	Woodward and Brown, Architects, Kennington Oval, S.E.	
Grays Inn-road, W.C. - Casual Ward	Urban District Council	H. Williams Mellor, Surveyor, 17, Buckingham-street, W.C.	
Warrington - Harbour Offices	Urban District Council	Talford Strick, Clerk, Harbour Office, Swansea	
Ballymacaree - Completion of St. Patrick's Parish Church	Urban District Council	Samuel P. Close, Architect, Donaghadee Buildings, Belfast	
Kirkcubbin - Rebuilding Hotel	Urban District Council	John King, Architect, Montrose	
Dorchester - Rebuilding Hotel	Urban District Council	A. L. T. Tiley, Architect, Dorchester	
Ashford, Kent - Additions to Beaver-road Board Schools	Urban District Council	John and Lacey, Architects, Ashford, Kent	
Mythenquay - Schoolroom	Urban District Council	William J. Williams, Clerk, 1, High-street, Cardigan	
Isle - Public Offices	Urban District Council	John, Ralph, and Heaton, Architects, Wigton	
Newcastle-upon-Tyne - Staircase, &c., at Workhouse	Urban District Council	Chapman and Snape, Architects, Newcastle-upon-Tyne	
Bromwich-by-Bow - Additions to Mortuary at St. Asylum	Urban District Council	J. and S. F. Clarkson, Architects, 136, High-street, Poplar, E.	
Trusley - Thirty Cottages	Urban District Council	Arthur J. Close, Architect, Donaghadee Buildings, Belfast	
Bury Port - Schools, &c.	Urban District Council	Richard Williams, Architect, Bury Port	
White-hall - Coast-guard Buildings	Urban District Council	The Director of Works Dept., 21, Northumberland-avenue, W.C.	
Barry - Rebuilding Hotel	Urban District Council	W. B. Williams, R.E., Architect, 1, Clifton Inn, E.C.	
Edinburgh - Rebuilding Hotel	Urban District Council	Herbert Green, Architect, Norwich	
T. - 20 Cottages - Dwellings for Working Classes	Urban District Council	B. J. Francis, Architect, Aberystwyth	
Wendoverham - Church Restoration	Urban District Council	W. B. Henderson, W.S., Lindisfarne	
Llanelli - Greenhouse - Classroom, &c.	Urban District Council	P. Palmer, Clerk, Kirton-in-Lindsey, Lincs.	
South Green - Additions to Buildings to Police Station	Urban District Council	C. Davies, Architect, Estate Office, Rensdale-rd., Herne Hill, S.E.	
Kirton-in-Lindsey - Enlargement of Boys' School	Urban District Council	The Secretary, 29, St. John-street, Glasgow	
Edinburgh - Hotel & Flats	Urban District Council	J. H. B. Henderson, W.S., Lindisfarne	
Wendoverham, Glasgow - Fifty-Eight Workmen's Cottages	Urban District Council	John Burton, Architect, Warrington	
Blackheath - Additional Buildings to Police Station	Urban District Council	Stephen Wilkinson, Architect, Felton, near Chester-le-Street	
Kendal - Alterations to Banquet House	Urban District Council	G. J. and W. Thorneley, Architects, Buxton	
Wotton-le-Wear - Laundry	Urban District Council	P. H. H. Shaw, Architect, 10, Chester-st., Chester	
Wotton-le-Wear - Laundry	Urban District Council	J. B. and W. Thorneley, Architects, Powell's Chambers, Millgate, Wigan	
Wotton-le-Wear - Laundry	Urban District Council	John H. Davies and Sons, Architects, Newcastle-upon-Tyne	
Wotton-le-Wear - Laundry	Urban District Council	Stephen Wilkinson, Architect, 10, Chester-le-Street, Chester	
Wotton-le-Wear - Laundry	Urban District Council	J. Minnis, 29, Lonsdale-rd., Harnes	
Wotton-le-Wear - Laundry	Urban District Council	R. and E. E. Pearson, Architects, 27, Castle-street, Edinburgh	
Wotton-le-Wear - Laundry	Urban District Council	Blair and Brown, Architects, 1, Harrow-road, London	
Wotton-le-Wear - Laundry	Urban District Council	R. G. Keating, 1, Colchester-terrace, N.W.	
Wotton-le-Wear - Laundry	Urban District Council	Hedley J. Price, A.R.I.B.A., 24, Low-paved, Nottingham	

ROADS AND STREETS—continued.

Brentford—Road Construction 1,675 ft. run	Urban District Council	Edward Millard, Surveyor, J. Finsbury-circus, E.C.	Sept. 9
Swinton—Street Works	Urban District Council	Henry Entwistle, Surveyor, Council Offices, Swinton	" 9
Coventry—Concrete Flagging	Urban District Council	L. L. Baldwin, Surveyor, Bank Chambers, Coventry, Leicester	" 10
Leaking—Kerlingham—Channelling, Paving, &c.	Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking, Essex	" 10
Easton—Paving Back Streets	Urban District Council	The District Surveyor's Office, Whiteorth-road, Grangewood, Yorks.	" 11
Stretford, Manchester—Street Works	Urban District Council	G. H. Abraham, Clerk, Old Trafford	" 11
Walsby—Paving 1,300 yards super.	Urban District Council	C. B. Oddy, Borough Engineer, Municipal Offices, Tonfryst	" 11
Todmorton—Street Works	Highways Committee	C. B. Pease, Borough Engineer, Town Hall, Todmorton	" 11
Levensham, S.E.—Kerling and Pav. Woodland-street	Borough Council	The Surveyor's Department, Town Hall, Colford	" 11
Halifax—Forming Main-street	Chelmsford Rural District Council	W. Cleland, Valuation, Architect, 29, Southgate, Halifax	" 14
Springfield—Making-up Navigation-road and Queen's-road	Urban District Council	H. Glynne Warme, Surveyor, Avenue Chambers, Chelmsford	" 14
Cockermouth—Water Main, &c.	Urban District Council	J. B. Wainwright, Surveyor, Town Hall, Colford	" 14
Haswell, W.—Street Works	Urban District Council	S. W. Barnes, Surveyor, Church-road, West. Harwell	" 16
London, E.C.—Asphalt Paving Works	Urban District Council	The Public Health Department, Guildhall, E.C.	" 17
Amble—Making-up Roads	Urban District Council	W. Gibson, Surveyor, Town Hall, Amble	" 17
South Norwood—Repairing Whitcombe-road	Croydon Town Council	The Borough Road Surveyor's Office, Town Hall, Croydon	" 17
London, E.C.—Wood Paving Carriageways	Urban District Council	The Public Health Department, Guildhall, E.C.	" 17
Deptford, S.E.—Paving 1,200 yards, Sandford-st. and Whitaker-st.	Urban District Council	W. Gibson, Surveyor, Town Hall, Amble	" 17
Wimbledon—Making-up Roads	Urban District Council	C. H. Cooper, M.I.C.E., Engineer, Broadway, Wimbledon	" 18
Newcastle-upon-Tyne—Wood Paving Central Station	North-Eastern Railway Co.	Charles A. Harrison, Central Station, Newcastle-upon-Tyne	" 18
Leeds—Making-up Roads	Urban District Council	W. Gibson, Surveyor, Town Hall, Amble	" 18
Tottenham—Kerling, Channelling, &c., St. Ann's-road	Urban District Council	H. W. Prescott, A.M.I.C.E., Engineer, 712, High-road, Tottenham	" 21
Middlesbrough—Paving Carriageways 21,000 square yards	Streets Committee	F. Baker, C.E., F.G.S., Borough Engineer, Municipal Bldgs., Middlesbrough	" 22
Stow Hill—New Roads	Urban District Council	Vigers and Co., 4, Frederick-st., Old Leary	" 22
Witham—Stone Paving at Chipping Hill	Urban District Council	W. F. Perkins, Surveyor, Witham	" 29
Enfield—Victoria Stone Paving, &c.	Middlesex County Council	Henry T. Waklam, County Engineer, Guildhall, Westminster	Oct. 1

SANITARY.

St. Albans—Lavatory to Courthouse	Hertfordshire County Council	Urban A. Smith, County Surveyor, 41, Parliament-st., Westminster	Sept. 9
Griffithstown—Water Main	Urban District Council	T. F. Holmes, County Engineer, Colford	" 9
Brockley, S.E.—Water-Closets, &c., at Cemetery	Deptford Borough Council	The Borough Surveyor's Office, 403, New Cross-road, S.E.	" 9
Leigh—Sewers, &c.	Urban District Council	A. J. Prior, Engineer, Lytham	" 9
Leaking—surface Water Drainage	Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking, Essex	" 9
Swindon—Sewer	Corporation	The Borough Engineer's Office, Town Hall, Sunderland	" 11
Exeter—Sanitary Works at Brentwood School	Hackney Union Guardians	F. R. Coles, Clerk, Hackney Union, Homerton, N.	" 11
Weymouth—Extending Outfall Sewer	Corporation	W. Gibson, Surveyor, Town Hall, Amble	" 11
Levensham—Sewer, &c., Brockley Valley to Stouden Park	Rural District Council	The Surveyor, Town Hall, Colford	" 12
Tottenham—Sewer, &c.	Urban District Council	H. G. Keywood, Engineer, Public Health Chambers, Malden	" 14
Bury—Sewage Disposal Works	Corporation	James Dewhurst, Esq., Avenue Chambers, Market-rd., Chelmsford	" 16
Great Waltham—Sewer, &c.	Chelmsford Rural District Council	The Town Clerk, Public Health Department, Guildhall	" 17
Leithbury, E.C.—Alterations to Underground Conveyance	Urban District Council	Sam Shaw, M.I.C.E., Church-street Chambers, Dewsbury	" 17
Mytholmsey—Main Drainage Works	Urban District Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	Oct. 8
Erith—Low and High Level Sewers	Urban District Council		

STEEL AND IRON.

Copley—Steel Joists, &c.	Halifax School Board	Herbert W. Booth, Architect, Hopwood Hall, Halifax	Sept. 9
London, E.C.—Steel Joists	Urban District Council	C. W. Bird, Secretary, 14, North-st., London	" 9
Glasgow—Cast-Iron Pipes 750 tons	Corporation	James M. Dale, Water Engineer, 45, John-st., Glasgow	" 9
Bournemouth—Steel Grooved Girder Rails, &c.	Town Council	F. W. Lacey, M.I.C.E., Barrage Engineer, Mun. Offices, Bournemouth	" 16
Amsterdam—Asphalted Cast-Iron Pipes 3,675 tons	Netherlands Ministry Colonies	The Commercial Department of the Foreign Office, Whitehall, S.W.	" 18
London, N.W.—Cast-Iron Piping	London Railway Co.	The Crown Agents for the Colonies, Downing-street, S.W.	" 19
London—Steel Grooved Girder Tramway Rails 5,000 tons	British Electric Traction Co.	The Chief Engineer, Donington House, Norfolk-street, W.C.	" 20
Buxton—Cast-Iron Main and Specials	Gas Committee	Richard Barker, Gas Engineer, 10, Broad-st., Buxton	" 26
London—Steel Stanchions, Girders, &c., 360 tons	Urban District Council	Rushton, Proctor, and Co., Sheet Ironworks, Lincoln	" 26
London, S.W.—Slab Rails, &c.	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	Oct. 8
London, S.W.—Tram Rails, &c.	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 8

STORES.

Stepney, E.—Timber, Varnishes, Oil, Bricks, Lime, &c.	Borough Council	M. W. Jamieson, Clerk, 20, Eng. 15, St. Giles-street, Whitechapel, E.	Sept. 9
Romford—Granite Spalls 60 tons	Urban District Council	William Smith, Borough Engineer, 24, North-st., Romford	" 9
South Alderhot—Timber and Building Materials	Urban District Council	Ed.-Col. H. Jerome, Royal Engineer Office, South Alderhot	" 9
Edmonton, N.—Broken Granite	Urban District Council	C. H. Eades, Engineer, Town Hall, Edmonton	" 10
Christchurch, Hants—Chertbury Quarries 200 tons	Urban District Council	Edward J. Legg, Borough Engineer, Town Hall, Christchurch	" 10
Edmonton, N.—Portland Cement 100 tons	Urban District Council	C. H. Eades, Engineer, Town Hall, Edmonton	" 10
Edmonton, N.—Stoneware Pipes Six Months	Urban District Council	C. H. Eades, Engineer, Town Hall, Edmonton	" 10
Fleetwood—Broken Stone	Urban District Council	Joseph Tildesley, Clerk, Town Hall, Fleetwood	" 14
Bradford—Miscellaneous Goods One Year	Urban District Council	F. Stevens, Town Clerk, Town Hall, Bradford	" 14
London, E.C.—Telegraph Poles	Postmaster-General	C. E. Stuart, Controller of Stores, General Post Office, E.C.	" 20
Ashton-in-Makerfield—Granite Macadam 250 tons	Urban District Council	J. W. Liverisage, Secy., Public Offices, Ashton-in-Makerfield, Lancs.	" 20

CHIPS.

On Sunday, the doubled portion of the Midland and South-Western Jointing Railway from Ludgershall to Collingbourne was opened for traffic. The improvements are being effected at Ludgershall Station in order to meet the requirements of the permanent military train at Tidworth.

On Saturday, in the little North Devon churchyard of Filleigh, within a gunshot of Castle-hall, the mansion of Earl Fortescue, a cross in memory of the late Earl, who was the son of the Earl, who was killed at the Diamond Hill engagement in South Africa on June 11, 1900, was unveiled. It is a huge memorial in the form of an obelisk, of Devonshire granite cross set on an octagonal base, and was uncovered by General Sir Drury Lowe, G.C.B. The cross, which was executed by Mr. Roach, of Plymouth, is after the design of the artist and cross, dug up some years ago on Castle Hill estate.

The Salford Town Council accepted on Wednesday a tender for the erection and completion of seventeen houses and shops for the sum of £16,970, and fifteen houses and shops for £17,561 on the barracks site.

At Tuesday's meeting of the town council of Warrington it was reported that Mr. J. J. Webster, M.Inst.C.E., had attended a meeting of the General Purposes Committee of the Corporation of Warrington of the proposed alteration of Warrington Bridge by means of cantilevers, and explained the several schemes submitted by him. He estimated the cost of constructing the proposed cantilevers at £3,125, and the cost of constructing a steel arch bridge at one span along the present structure at £9,156. The Committee approved of the cantilever plan, and Mr. Webster was requested to prepare the necessary detailed drawings and specifications, and a majority of one vote, 14 to 13, the report was adopted.

Quarndon Church, in the Moorlands, six miles from Buxton, was opened on Tuesday by the Bishop of Lichfield. The church, which replaced the one, has cost £2,200. The architect was Mr. W. H. Bryden, of Buxton.

Trade News.

WAGES MOVEMENTS.

BRADFORD.—There is no further development in the building trade dispute. During the last three weeks the number on the books of the Masons' Union has decreased by about sixty, places having been found for the men elsewhere. It is stated that work could be found for more if they cared to go, but many of the men prefer to take their chances in Bradford. Owing to the support received from other branches, and the levies paid by those for whom employment has been obtained under conditions satisfactory to the union, it is still possible to pay an allowance of 24s. per week to the men out of work. The joiners have sent about sixty men away during the last three weeks, bringing the number on their books down to about 170. This reduction has permitted a small increase in the allowance received by the remainder. On the other hand, it is stated that there is no diminution in the number of applicants for employment dealt with at the Labour Bureau established by the masters, and the places of most of the joiners, bricklayers, and wallers have been filled up, though there are still vacancies for skilled stone-cutters.

WORKINGTON.—The dispute which led to the strike of the Cumberland ironstone quarriesmen has been settled, after a stoppage of three weeks. The men resumed work on Monday morning at the old rate of wages, but the question in dispute has been referred to Mr. Gordon Falcon, of Workington, an arbitrator. The masters are asking for a reduction equal to 10 per cent.

The new Board schools erected at Choppell, Co. Durham, were opened on Saturday. The buildings, which command a picturesque site, are of red brick, and provide accommodation for 650 children, the mixed department seating 450, and the infants' department 200. The work has been carried out by Messrs. Turner Bros., Gateshead, from plans prepared by Mr. Oswald.

The corporation of Carmarthen have obtained from the Local Government Board sanction to borrow £15,000 for further expenditure on the waterworks.

New offices for the Tottenham and Edmonton Gas Board and Coke Co. have been built recently from plans prepared by Mr. John S. Corder, of Wimborne House, Ipswich. The style is a free treatment of German Renaissance. The structure rests on a rough granite base 4 ft. high, and above this the construction is of red brick, relieved by red Ballochyley stone, yellow Mansfield stone, and Ganton's terracotta. The clerk of works was Mr. Harry Cockrell, of Ipswich.

W. J. LASCELLES and Co.,

121, BUNHILL ROW, LONDON, E.C.

TELEPHONE No. 270.

HIGH-CLASS JOINERY.

LASCELLES' CONCRETE.

Conservatories & Greenhouses.

WOODEN BUILDINGS.

BANK, OFFICE, & SHOP FITTINGS.

CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

WM. OLIVER & SONS,

MALOGANY, WAINSCOT, WALNUT,

TEAK, VENEER, and FANCYWOOD

MERCHANTS.

120, BUNHILL ROW, LONDON, E.C.

The most extensive Stock of every kind of Wood and Veneer and Board, dry and fit for immediate use.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian	£3 0 0	to £3 10 0
Rolled-Steel Joists, English	6 10 0	" 6 15 0
Wrought-Iron Girdler Plates	7 13 0	" 7 15 0
Bar Iron, good Staffs	6 15 0	" 8 10 0
Do., Lowmoor, Flat, Round, or Square	20 0 0	" 20 0 0
Do., Welsh	5 15 0	" 5 17 6
Boiler Plates, Iron—		
South Staffs	10 0 0	" 10 0 0
Best Sheeshell	12 0 0	" 12 0 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., 26 lbs.		
Builders' Hoop Iron, galvanised, £13 10s. od. per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		
6ft. to 8ft. long, inclusive	Per ton.	Per ton.
gauge	£11 5 0	to £11 12 6
Best ditto	11 15 0	" 12 12 6
	Per ton.	Per ton.
Cast-Iron Columns	£6 10 0	to £8 10 0
Cast-Iron Stanchions	6 10 0	" 8 10 0
Rolled-Iron Fencing Wire	8 0 0	" 8 5 0
Rolled-Steel Fencing Wire	6 10 0	" 6 15 0
Cast-Iron Sash Weights	8 0 0	" 8 5 0
Cut Clasp Nails, 3in. to 6in.	9 15 0	" 9 15 0
Cut Floor Brads	9 10 0	" 9 10 0
Wire Nails (Points de Paris)—		
0.67 3 9 10 11 12	13 14 15 B.W.G.	
8.6 9 9.3 9.9 10.3 11.0 11.9 12.6 13.6	per cwt.	
Cast-Iron Socket Pipes—		
3in. diameter	£3 15 0	to £6 0 0
4in. to 6in.	5 12 6	" 5 17 6
7in. to 24in. (all sizes)	5 0 0	" 5 5 0
(Coated with composition, 3s. od. per ton extra; tinned and bored joints, 5s. od. per ton extra.)		
Pig Iron—		
Cold Blast, Lilleshall	105s. to 112s. 6d.	
Hot Blast, ditto	65s. od. to 70s. 6d.	
Wrought-Iron Tubes and Fittings—Discount of Standard		
List 6s. 6d. —		
Gas-Tubes	70½ p.c.	
Water-Tubes	65 "	
Steam-Tubes	60 "	
Galvanised Gas-Tubes	57½ "	
Galvanised Water-Tubes	52½ "	
Galvanised Steam-Tubes	47½ "	

	10wt. cashs.	5wt. cashs.
Zinc, English (London mill)	£13 10 0	to £12 15 0
Do., Vieille Montagne	23 0 0	" 25 10 0
Sheet Lead, 3lb. per sq. ft. super.	12 5 0	" 12 10 0
Pig Lead, in lev. pigs	12 0 0	" 12 5 0
Lead Shot, in 28lb. bags	15 0 0	" 15 5 0
Copper Sheets, sheathing and rods	83 0 0	" 83 0 0
Copper, British Cake and Ingots	71 15 0	" 72 5 0
Tin, Straits	117 5 0	" 117 10 0
Do., English Ingots	125 0 0	" 125 10 0
Spelter, Silesian	16 17 6	" 17 7 6

TIMBER.

	per load	£10 15 0	to £16 15 0
Teak, Burmah	13 13 0	" 13 13 0	
Quebec Pine, yellow	3 17 6	" 4 15 0	
" Oak	4 2 6	" 6 15 0	
" Birch	4 7 6	" 6 10 0	
" Elm	5 10 0	" 6 5 0	
" Ash	4 5 0	" 6 5 0	
Danish and Mamel Oak	2 17 6	" 4 10 0	
Fir	3 2 6	" 4 7 6	
Wainscot, Elga p. log	2 7 6	" 3 12 6	
Lath, Danish p.	4 10 0	" 12 0 0	
St. Petersburg	4 0 0	" 8 10 0	
Greenheart	7 15 0	" 8 0 0	
Nex	7 0 0	" 15 0 0	
Sesquiao, U.S.A.	0 1 9	" 0 2 0	
Malabary, Cuba, per super foot			
lin. thick	0 0 6	" 0 8 0	
" Honduras	0 0 6	" 0 0 7	
" Mexican	0 0 4	" 0 0 4	
" African	0 0 3	" 0 0 3	
Cedar, Cuba	0 0 3	" 0 0 3	
" Honduras	0 0 3	" 0 0 3	
Satinwood	0 0 10	" 0 1 5	
Walnut, Italian	0 0 3	" 0 0 7	
" American (logs)	0 2 3	" 0 4 6	

Deals per St. Petersburg Standard, 120—12ft. by 1½in. by 1in. —	£22 10 0	to £29 15 0
Quebec Pine, 1st	15 15 0	" 20 15 0
" 2nd	11 5 0	" 13 10 0
Canada Spruce, 1st	12 0 0	" 14 10 0
" 2nd and 3rd	9 0 0	" 11 0 0
New Brunswick	8 15 0	" 9 10 0
St. Petersburg	10 0 0	" 10 5 0
Swedish	11 10 0	" 23 10 0
Finland	9 0 0	" 12 0 0
White Sea	11 0 0	" 22 5 0
Baltics, all sorts	9 0 0	" 13 10 0
Flooring Boards, per square of lin. —		
1st prepared	£11 6 0	" £17 16 0
2nd ditto	0 10 0	" 0 13 6
Other qualities	0 5 6	" 0 12 6

Staves, per standard M:—		
U.S., pine	£17 10 0	" £15 0 0
Nemel, or pipe	220 0 0	" 230 0 0
Mamel, brack	190 0 0	" 230 0 0

STONE.

Darley Dale, in blocks	per foot cube £3 2 1½
Hard Muschell ditto	" 0 2 4½
Hard York ditto	" 0 2 1½
Ditto ditto (in sawn both sides, landing, random sizes)	per foot sup. 0 2 5
Ditto ditto (in slabs sawn two sides, random sizes)	" 0 1 3
Hopton-Wood, Hard Bed in blocks, per foot cube	0 2 3
Ditto ditto (in sawn both sides, landing, random sizes)	per foot sup. 0 2 6
Ditto ditto (in sawn both sides, landing, random sizes)	per foot sup. 0 1 3½
Portland, Whit Bed	per foot cube 0 2 0½
Ditto Base Bed	" 0 2 1½

All F.O.R. London.

OILS.

Linseed	per tun £31 0 0	to £31 5 0
Rapeseed, English pale	28 5 0	" 28 10 0
Do., brown	28 10 0	" 28 15 0
Cottonseed, refined	25 0 0	" 25 5 0
Oliva, Spanish	38 0 0	" 40 0 0
Seal, pale	23 15 0	" 24 0 0
Cocunut, Cochin	31 0 0	" 31 0 0
Do., Ceylon	28 5 0	" 28 10 0
Palm, Lagos	25 0 0	" 25 10 0
Oliva	17 5 0	" 19 0 0
Lubricating U.S.	per gal. 0 7 0	" 0 8 0
Petroleum, refined	0 5½	" 0 5½
Tar, Stockholm	per barrel 1 6 0	" 1 6 0
Do., Archaeng	0 19 6	" 0 1 0
Turpentine, American	per tun 37 0 0	" 37 5 0

The celebrated collection of illuminated and other manuscripts belonging to the Earl of Crawford and forming part of the great library at Haigh Hall has been sold to Mrs. Rylands, the founder of the John Rylands Library at Manchester.

A new colliery has been commenced at Ferry Hill, Co. Durham, by Messrs. Bolckow, Vaughan, and and Co., under the joint management of Messrs. C. F. Linton and Thos. Ainsley, engineers. Miss Ainsley, the little daughter of the engineer, out the first sod on Thursday last week. A new railway now being constructed will join the North-Eastern Railway at Spennymoor. The company intend to build about 250 houses, which will do much to bring back the former prosperity of the village. Mr. James Johnson, of East Boldon, has charge of the sinking operations.

SZERELMEY STONE LIQUID.

THE ONLY RELIABLE REMEDY FOR DAMP WALLS AND STONE DECAY.

IT HAS STOOD THE TEST OF TIME!

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STEEL AND WROUGHT IRON CONSTRUCTIONAL WORK.

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RIVETTED GIRDERS & CAST IRON

OF ALL DESCRIPTIONS

MADE IN LONDON.

ECCLESTON IRONWORKS, PIMLICO, & HAYLE FOUNDRY WHARF, NINE ELMS.



TENDERS.

* * * Correspondents would in all cases oblige by giving the addresses of the parties employing, if any rate, of the accepted tender; it is to the value of the information.

BARNES.—For the erection of a bridge at Barnes, for the Wetherby Rural District Council.
Drake and Barlow, Hunslet, Leeds £221 0 0
Accepted.

BIRMINGHAM.—For providing a new baler at the St. Ann's Mill, for the town council.
Hipperton Bros. (accepted) £147 6 0

BIRMINGHAM.—For supply of a 10-ton steam roller, for the rural district council.
Atching, Porter, and Co., Rochester £173 16 0
Accepted.

BIRMINGHAM.—For a sewer crossing the Birmingham and Dudley Canal at the Town-arch-bridge for the Birmingham Town and its Drainage Board.
Lowe, T. and Sons, Brighton

Tender accepted £2,781 10 0

Lowest of six tenders received.

BIRMINGHAM.—For the erection of a sanitary annex at St. Ann's Workhouse, Bristol, for the guardians of the poor of the city and county of Bristol. Mr. F. W. BAKER, St. Peter's Hospital, Bristol, architect. Quantities by the architect.

Wall, F. £253 0 0
Fisher £913 0 0
Duffell and Son £913 0 0
Giles £847 0 0
Dwining A. £813 0 0
Duffell and Son £847 0 0
Bewman J. £847 0 0
Chubb and Sons £753 0 0
Huthly, J. £753 0 0
Architect's estimate £493

CLEVELAND.—For the erection of main buildings, boiler-house, and chimney-tank, for the Cleveland Steam Laundry Company. Mr. T. J. Moseley, G.E. 2, Victoria Mansions, Westminster, S.W., and Baldwin-street, Bristol, engineer.

Green, W. A., Cleveland (accepted) £1,815 0 0

COWES.—For widening Blowin's-hill-road, Cowes, for the Selsey Rural District Council.
Warren and Phipps (accepted) £39 13 0

COWES.—For repairs to various school buildings, for the Cowes Local School Board.
Bower, H., Blyth (accepted)

EAST HAM.—For adding classrooms to Vicarage-lane temporary school, for the school board.
Clements (accepted) £243 0 0

EXETER.—For additional w.c. accommodation at the new receiving-house at the schools, for the Strand Board of Guardians.
Culton and Co., Hickey (accepted) £275 10 6

FISHERY, N.—For constructing manual instruction rooms at the East and North Fishery Schools, for the school board.

East North
Dowling, North Fishery £753 0 £294 10
Wheeler & Peakes, North Fishery 788 10
Cooper, T., Church End 751 12 848 0
Galle, Hendon 781 0 814 0
Rees 759 0 799 0
Stonell, East Fishery 733 15 798 10
Bathurst, North Fishery 759 0 770 0

HEATH HEW-CROFT.—For alterations and additions to the w.c.s, for the board of guardians.
Wizes, G., Watford £705 0 0

Payne, J., Hemel Hempstead £59 0 0
Simmons, E., Hemel Hempstead £13 0 0
Smith, S. C., Hemel Hempstead 615 0 0
Sears, W., Hemel Hempstead 503 0 0

Goss, J. J., Watford 599 0 0

Tonge, H. L., Jubilee-st., Watford 599 0 0
Accepted.

LEO BLADE, GLOUCESTERSHIRE.—For alterations and additions to the Swan Hotel, Lechlade, for Messrs. R. B. Bowley and Co., Ltd., Swindon. Messrs. William Drew and Sons, M.S.A., Regent-circus, Swindon, architects.

Williams, J., Swindon (accepted) £344 10 6

LEADS.—For the erection of buildings in Upper Fountain-street, for the Leeds Trades' Council.
Leeds Cooperative Builders, Ltd. (accepted)

LEICESTER.—For the erection of a block of school buildings, to be known as the Farmington Schools, for the Leyton School Board. Mr. William Jacques, 2, Fennell-st., E.C., architect. Quantities by Messrs. H. L. Cuthbert and Sons.

Watts, Johnson, and Co. £230,914 0 0
Perry and Co. £2,733 0 0
Stimpson and Co. £2,539 0 0
Battley, Son, and Holmes £2,487 0 0
Madison, W. J. £2,624 0 0
Gregor and Son £2,253 0 0
Sharpe, G. £2,165 0 0
Reed, A. £2,458 0 0
Coxhead, F. J. £3,761 0 0

LONDON.—For works of painting, &c., at various school buildings, for the London School Board.
Cranston-street School—Painting exterior

Garrett and Son £261 0 0
Rice and Son 512 0 0
Royer, W., and Son 48 0 0
Gould, W. V. 473 0 0
Downs, W. (accepted) 440 0 0

LYDLE-ROAD SCHOOL—Painting exterior

Line, H. £180 0 0
Groves, H. 169 0 0
Rouyer, J. and C. 159 0 0
Rice and Son 123 0 0
Kemp, G. 121 0 0
Garrett, J., and Son 118 0 0
Maxwell Bros., Ltd. (accepted) 105 0 0

King and Queen-street School—Painting exterior

Romey, J. H. £247 0 0
Holiday and Greenwood, Ltd. 245 0 0
Sayer, W., and Son 231 0 0
Williams, H. J. 129 1 0

Gould, W. V. 178 0 0
Triggs, E. (accepted) 164 0 0

Upper Kensington-lane School—Painting exterior

Patrick, J., and M. £214 0 0
Davies, W. 106 0 0
Smith, W., and Son 233 0 0
Brittain, G. 171 0 0

Ford, J. F. 139 0 0

Rice and Son 127 0 0

Tucker, E. R. 127 0 0

Maxwell Bros., Ltd. (accepted) 123 0 0

Brecknock School—Painting exterior

Balfour, A., and Co. £193 3 4
Wall, H., and Co. 233 0 0
Marchant and Hirst 232 0 0
Stevens Bros. 279 0 0

Buckridge, H. S. 210 0 0

Britton and Edwell (accepted) 105 0 0

Stanthorpe School—Painting exterior

Crisp, T. £298 15 0
Buckridge, R. S. 183 0 0
Wall, H., and Co. 179 0 0

Chilley, P. 176 0 0

Britton and Edwell 175 0 0

Marchant and Hirst 168 0 0

Chiswell, F. T. 167 0 0

Chappell, W. (accepted) 133 0 0

Berner-street School—Painting exterior

Crisp, T. £217 0 0
Johnson and Co. 315 0 0
Corfield and Co. 316 0 0

Vigor and Co. 346 0 0

Derby, A. W. 290 0 0

Robey, J. T. 268 10 0

Haydon, J. 214 0 0

Gibb, D., and Co. 210 0 0

Holliday, J. F. (accepted) 215 0 0

Bromley Hall-road School—Painting exterior

Vigor and Co. £194 10 0
Derby, A. W. 192 0 0
Gibb, D., and Co. 189 0 0

Haydon, J. T. 178 0 0

Holliday, J. F. 154 10 0

Corfield and Co. (accepted) 149 0 0

PERKINS-ROAD.—For alterations to Penwith Board

School.
Coombe and Son, Gouwhaven (accepted).
(Lowest tender received.)

RAMSEY, HANTS.—For erecting a school and schoolhouse

at Ramsey St. Mary's, for the school board.
Gutteridge (accepted) £2,518 15 0

UNEQUALLED FOR ALL DECORATIVE PURPOSES

Aspinal's

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DECORATOR'S ENAMELS,

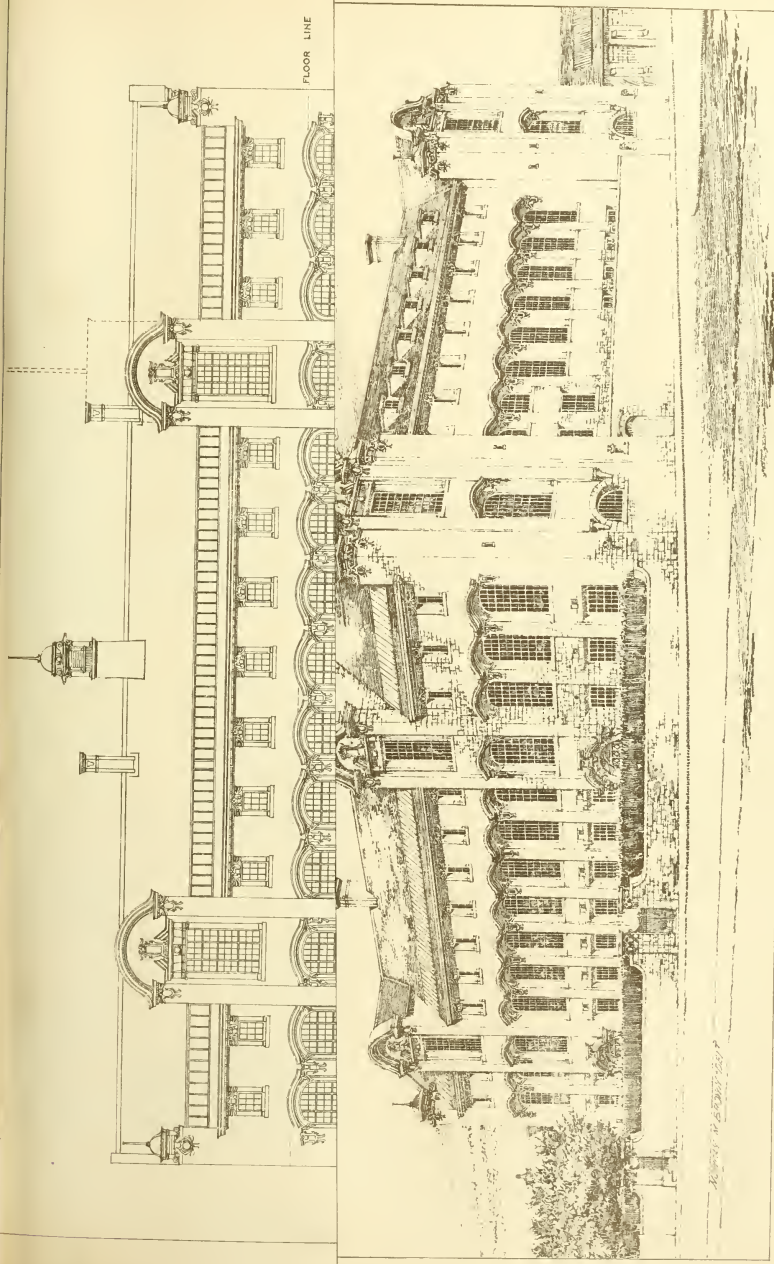
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SLOW DRY, GOOD FLOW, VERY ELASTIC, WILL NOT CRACK. UNEQUALLED FOR ALL HIGH-CLASS WORK WHERE A GOOD FINISH IS REQUIRED.

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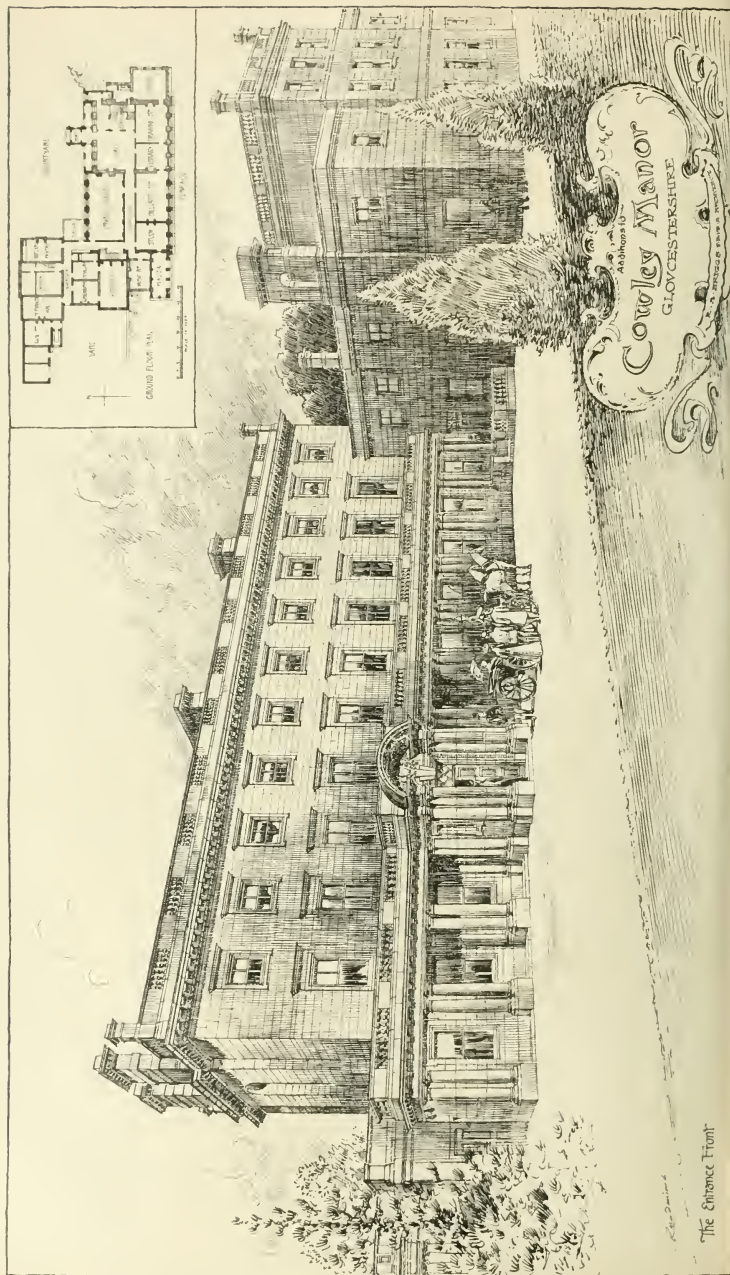


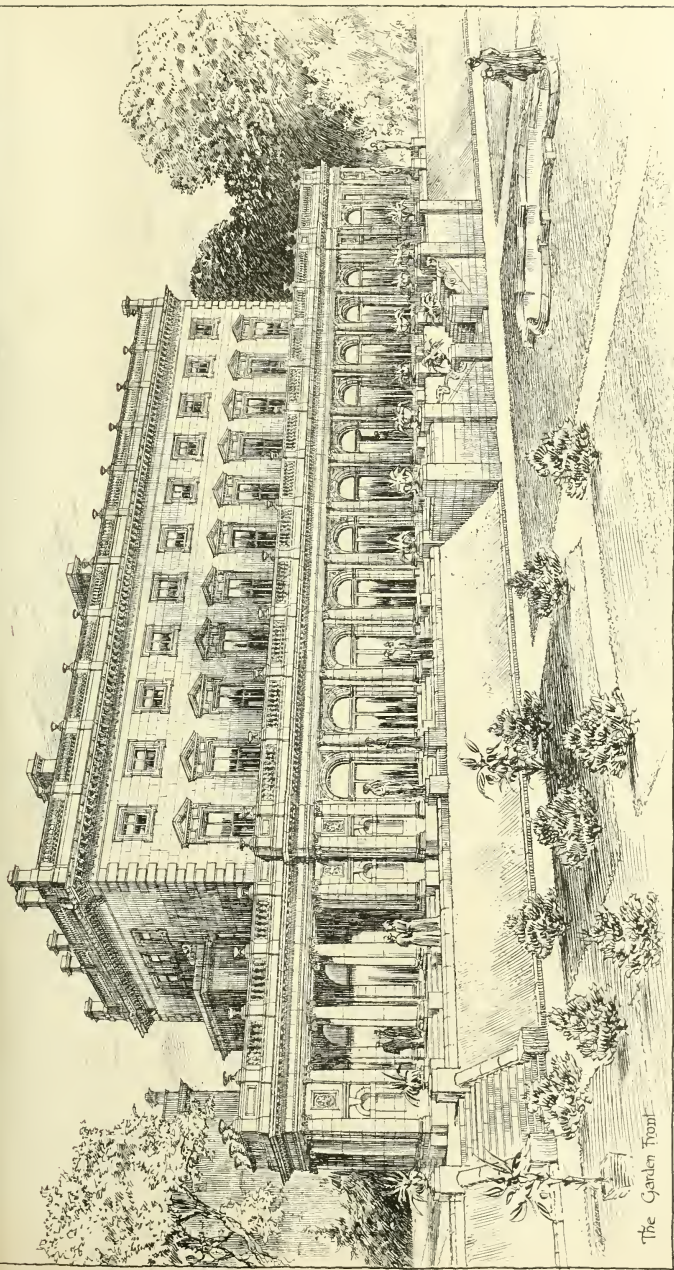
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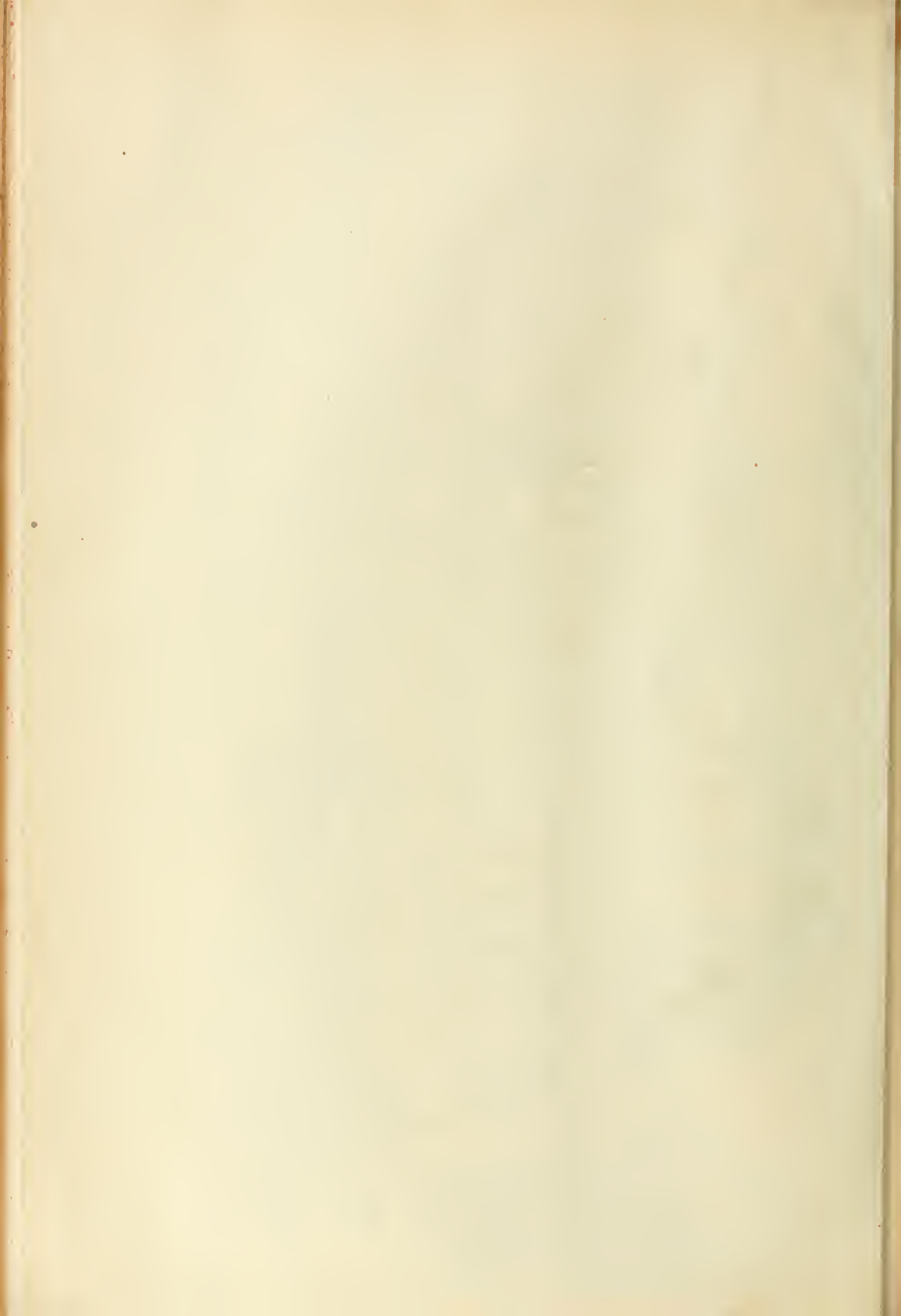


THE BUILDING NEWS, SEPT 6, 1901.





The Garden Front



THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXXXI.—No. 2436.

FRIDAY, SEPTEMBER 13, 1901.

BUILDINGS OF PUBLIC RESORT.

THE meaning to be attached to the term "public building" is not so obvious as it may appear, for we cannot say that it means a non-private building, or one entirely of public resort. A large number of buildings are of a semi-public character, half devoted to private and half to public uses, like banks, insurance offices, private hotels, and lodging-houses; others are of a more pronounced public character. We have to bring these two extremes into consideration before any set of rules can be laid down as to their structural requirements—in short, a national manner, we must take into account varying degrees of the public use. Churches and chapels, theatres, concert and music-halls, represent one extreme kind of the public edifice, while in the other extreme may be named banks, boarding-houses, and the like, and between these extremes may be found buildings of varying degrees of each of these functions. Do the statutory regulations of the London Building Act apply equally to all these kinds? Let us just consider the requirements of the conditions lately issued by the London County Council under the Metropolitan Management and Building Act Amendment Act of 1878, of which we gave a *résumé* a week or two ago. Churches deal mainly with theatres and other places of public resort within the county of London, including rooms and houses so adapted. Regulation 2 somewhat awkwardly and with much circumlocution deals with site in its relation with buildings of this kind. It says in effect that at least one-half of the total length of the boundaries of the site of a theatre or any such building "is to abut upon or front public thoroughfares," one of which thoroughfares is not to be less than 40ft. wide, and the other thoroughfare not less than 30ft. wide, if a footway of 20ft. is to suffice; it is further required that these widths must be throughout the same. Also that the frontage to a 40ft. thoroughfare is not to be less than one-sixth of the total length of the boundaries. Let us try to learn what this means. Take a rectangular site, say 150ft. deep and 50ft. wide. These—viz., 200ft., would form one half of the boundaries of the site, and would have to front roads or streets, one of which would be 40ft. wide and the others 30ft. The frontage of the side to the 40ft. road is not to be less than one-sixth of the total length of the boundaries—that is, in this imaginary case, it would be, if we are right in our conclusions, 400ft. $\div 6 = 66\frac{2}{3}$ ft., and therefore the frontage of the side would have to be placed on the longer side or road, which would have to be 40ft. wide. It could not be placed at the narrow end of rectangle, which would be 30ft. wide. The effect of this rule is to secure a plot or rectangle of sufficient frontage to the widest thoroughfare. The proportions we have imagined would not therefore be the best for a frontage of this depth. A narrow frontage to a deep site would therefore be impossible. Of course, such a condition materially lessens the danger of fire or a panic by increasing the possible means of escape by exit. Again, according to the regulations, there are to be no windows or openings in walls or roof within 20ft. of any adjoining building without an intermediate wall between of a height equal to the windows. To guard against possible spread of fire by ignition a wall is also to intervene between any openings and any inflammable structure or erection, &c., in any adjoining prop-

erty. In a recent fire the flames leapt over a wall of this kind 66ft. high. A public structure, therefore, of this class has to be partially isolated on two sides at least, and all openings are to be protected by walls or spaces. In reference to inclosure, the external walls must also be of brick or stone of the required statutory thickness. The building in this manner is practically cut off from adjoining properties, partly by isolation and partly by intercepting walls. Then the next requirement, after the external structure, is to make every separate part used by the public fire-resisting. The floors, tiers, and roof of the auditorium and all public parts must be of fire-resisting materials; the stage must be separated from the latter parts by a wall of the same character and of certain thickness; the proscenium opening and other apertures being protected by fire-resisting screens, and to have wrought-iron doors of certain specified construction. The separation of such structures into as many separate "risks" as possible is a recognised condition of safety. For this reason separate exits are necessary for the stage. Dressing-rooms must be provided in a separate block, or divided from the theatre proper by party-walls; the staircases thereto and to other parts must be constructed of fire-resisting materials, and these must have direct communication to the outside thoroughfares. Storerooms, workshops, and painting rooms are also to be separated from each other by bricks walls 9in. thick, all openings in them having fire-resisting doors. Corridors, passages, and vestibules are also to be of the same incombustible construction and of certain prescribed widths, and inclines are preferred instead of steps, 1 in 10 being the steepest gradient allowed.

The question of entrances and exits is another point of vital importance, and these should be as numerous as circumstances permit in a public building of this character. The new regulations provide as follows:—"Two separate exits shall be provided from every tier and floor which accommodates not more than 500 persons, and when a tier or floor accommodates more than 500 persons, an additional exit shall be provided for every 250, or part of 250, persons above 500. Each of such exits shall be not less than 5ft. wide between the walls at any point, or between the leaves of the doors when open. Two of the exits from each tier or floor shall deliver into different thoroughfares or ways. In the case of a tier or floor not accommodating more than 300 persons, two 4ft. exits will be required. If any tier or floor shall be divided into two or more parts, exits as set out above shall be provided from each of such parts. In calculating the number of persons which can be accommodated in any tier or part of a tier of such promises, the standing space from which a view of the performance can be obtained, as well as the seated area, will be considered. Exits shall be arranged so as to afford a ready means of egress from all parts of each tier or floor, and shall lead directly into a thoroughfare or way. It shall be compulsory on the management of such premises to allow the public to leave by all exit doors." The above rule is an important one. The requirement that each part of a floor or a tier or floor is to have two separate exits will considerably increase the safety of a theatre; equally necessary is it that standing as well as seated areas should be included—these and the last provision are not followed in many theatres in London. We will not discuss the provision as to width of exits, which are ample enough for ordinary use. The emptying of a crowded building can be very aptly compared to the issuing of water from a tank or reservoir. Both have a head or pressure, and the position and size of the openings have much to do with the results. A crowded audience leaving through one

doorway at the end of the building can be compared to water forcing its way through a single orifice at the bottom of a tank; it is under pressure, and the stream is concentrated. Halls with side openings, like orifices at a higher level, reduce the pressure—the stream is dispersed. The flow also of a liquid is conditioned by the shape of the orifice, and the architect may learn something in the size and shapes of his exits, so as to avoid dangerous and congested crowds. It would be useful to ascertain how many people under pressure of an ordinary kind could emerge through a doorway of a certain size per minute. The design of corridors and passages is of the utmost importance in such buildings. At their narrowest points they should be not less in width than the exits above described, as any sudden contraction or obstacle would be attended by serious consequences in case of a panic or rapid egress. In the case of vestibules, it is provided that not more than three tiers or floors, or three-parts of same, if divided, shall lead to one vestibule—a plan that distributes the crowd and insures safety. The outer entrances or passages that lead from a vestibule to a thoroughfare should also be a trifle larger than those leading to the tiers, and the rules accordingly provide that they be made at least one-third greater than the aggregate width of all the exits. Staircases should, of course, be regulated in width, according to the seated or standing area of audiences; those from any tier or part accommodating not more than 300 persons are to be at least 4ft. wide; from any tier or part holding more than that number the width is to be 5ft. at least, and, of course, they are to be of solid square stone (York) or fire-resisting material.

The above are the main rules provided by the L.C.C. for buildings of so extreme a public character as a theatre or room of structures to which the term applies in a greater or less degree. To take churches, chapels, and concert-rooms as instances: these are all of less hazardous character; they have fewer parts, tiers, or galleries, and are less combustible; and for these reasons may be said to stand somewhere between a theatre and a building of a semi-public description. They contain not so many inflammable materials like tiers of seats, stages, scenery, and other properties. The seats are as a rule on the ground floor, unless there are galleries, and the only risk is probably the organ or curtains of an orchestra platform, which may become a peril if once ignited. Many of the buildings of this kind comply with the condition of being partly detached or isolated, and in the case of rooms for public entertainments, music, and dancing, are under the Act. As regards single rooms for concerts, or churches and chapels, they are generally substantially built, and the chief requirement is that a building of this kind has a sufficient number of entrances or exits. Panic or fire is the only possible cause of danger, if we except the risks due to overloaded galleries, the fall of roofs or ceilings from any unforeseen cause, and it becomes the chief question how many of the assembly or audience can escape from the building within a given time. The pressure due to panic caused in any way, by blocking up the exits, seriously obstructs the freedom of the emerging crowd—a fact that has been unfortunately proved many times. The panic-stricken crowds, overcome by fear, rush to the doors before they can be opened, or obstruct, by their frantic efforts to escape, the only exit. Opposite streams of people also create obstruction, and the crowds avoid by providing exits at the ends of long lines, so that those at the extreme ends should not have to retrace their steps. Converging crowds create at the exit a compressed mass by opposite forces, and the extreme pressure produces a concentrated stream outwards. The only remedy for such

a condition is to relieve the lines of converging force to one exit, by providing other exits on opposite sides of the building, and thus the value of two or more thoroughfares is seen, as in the case of an isolated building. We have therefore three well-defined principles to keep in view—detachment or semi-detachment from surrounding buildings; well-constructed inclosing walls of incombustible materials; and exits on two or three sides. In most churches the west entrance and two side entrances or porches provide a fairly good number of exits for the dispersion of the congregation, though these are often made difficult of access by narrow passageways, and the blocks of seats near the entrances. Galleries and wooden fittings, as we see often in concert rooms, are a source of danger, and should be avoided, and the staircases to them should be made solid of stone or concrete, and be inclosed in walls to their landings.

Then we have the other kind of semi-public buildings, such as the hotel and large blocks of boarding-houses. These are divided by floors and partitions. The problem is how to construct the floors and suites of rooms by rendering each of these divisions separate risks. The ideal construction is to make each floor and story at least self-contained by fire-resisting floors and divisional walls, with a distinct means of exit into the street, a plan that would entail a group of staircases in a brick-inclosed tower at one or both ends of the block, so as to avoid any risk of fire such as the disastrous fatal catastrophe that happened to the Windsor Hotel in New York some years ago, where the flames spread along the corridors in every floor. The corridors should, if possible, be in pairs on each floor, and lead to a fire-resisting staircase; and every long corridor should be divided by light-and-air wells, with exits and stairs within them. Our great hotels in London and elsewhere have this system of communication that is at once direct and fire-resisting. Too often they are broken by angles and cross corridors. Wooden staircases connect them, which in case of an outbreak would completely render them useless for easy access or escape, by making them horizontal flues for smoke and flame. Then, between the corridors and the several suites of rooms, there ought to be wrought-iron sliding doors, which could be quickly closed, so that each corridor and its staircase or exit may be cut off from the suite of rooms and be made a fire-resisting means of escape. We are also not quite satisfied with the floor-construction of many of these structures, or that a perfect disconnection exists between the floor and partitions. Landings, staircases, and passages are often of wood construction; in fact, just those parts that ought to be above suspicion. In a perfect structure every window should become a means of escape, if necessary, by the use of outer balconies; when there are bay windows these balconies can be placed between with good effect. The modern highly equipped hotel, though conforming to the regulations of the L.C.C., leaves much to be desired. The plan has been the result of a compromise between the architect's adaptation from one or two models and the views of the proprietors and manager, without any particular care to insure the reduction of risks. So long as the regulations of the County Council have been carried out, the wishes of the company or manager and the commercial wants of the hotel are paramount. No one overhauls the plan or insists that the corridors should be inclosed by proper walls and be made direct, or the stairs and exits are placed in the right positions, or that the internal partitions are continuous. Not infrequently, to give more bedroom accommodation, wood and match-boarded partitions are introduced, besides all kinds of objectionable alterations made which add greatly to the inflammable conditions of the interior.

From what we have said, public buildings can be classified into those with extreme risks like theatres accommodating large assemblies or audiences, and full of inflammable materials; those of intermediate character providing large seated or standing areas, but of a less dangerous character; and those buildings of a semi-public kind like hotels, banks, schools, libraries, &c. Regulations necessary for the former of these structures would be excessive in the case of the latter conditions. The most dangerous public structure is certainly that which accommodates a large number of people in several tiers or floors depending on a few exits and tortuous corridors, where several hundreds are seated in upper galleries, inclosed by barriers and partitions, and who have to traverse passages and staircases before gaining the street level. Assemblies so accommodated are to a certain extent entrapped. On the other hand, a large assembly hall, the ground floor in an isolated building, as in a large hall, are, provided the exits are numerous enough, much less hampered, when the boundaries of the hall are also the external walls of the building. An objectionable arrangement is often met with in municipal buildings, where a large open hall on the first floor or higher is surrounded by offices and other departments. Even areas for light and air on both sides do not much improve the situation if such a thing as a fire occurred when the hall was packed. Where, then, that isolation or semi-detachment from other buildings, massive walls, and a roof of fire-resisting materials, and easy exits are the only conditions that can be satisfactory. We fear these conditions are very seldom met; there may be an approach to them, very satisfactory remedial measures at hand for extinguishing an outbreak of fire, and even good exits; but these may be rendered useless if a panic-stricken mob has to find or grope its way out through smoke-filled corridors, not so direct or wide as they should be.

A word may also be said here about the external architecture of public buildings—a theme of itself. Many of our edifices of this kind are disappointing. They do not possess the character of being devoted to public use, and we might imagine they were domestic or commercial buildings. All the attributes and qualities that we expect to find are wanting. There are small entrances, the windows look as if they properly belonged to a villa or domestic dwelling, small and final in their arrangement and dressings. In a word, the scale adopted is small and more suitable for a private residence. Examples are numerous amongst modern municipal buildings and vestry halls. There was a dignity about the fronts of some of the old guild halls and market halls, even of so late a date as that of the early Georges; we can also admire the largeness and breadth of the facades of structures of the class designed by the late Mr. Brydon, by Mr. Mountford, Mr. St. Aubyn, and other architects of our day, who have adopted Classic features on a dignified scale; but one of the prevailing weaknesses is the insignificant entrance.

If isolation is necessary as a physical condition of plan, it is not less valuable as an architectural quality. An isolated or detached building standing in a square or detached in its main facade from other premises at once gives the edifice dignity and importance, which it would not otherwise possess. As we at once attach to such a structure all the significance of a public function. The town hall, the municipal offices, any large public institution, the church, and the theatre attain prominence and dignity by isolation. By attachment to other buildings their importance is diminished. Nor is it necessary to point out that all the greatest edifices, whether of a civic or ecclesiastical character, are isolated or disconnected more or less. Next in importance is the accentuation of the entrance. Here

also our modern public buildings are often wanting. Owing to the insignificant size of principal doorways they lose much of the character that should be given them. A public edifice ought at least to exhibit a portal to correspond with interior capacity. Theatres have often the meanest entrances under a kind of projecting canopy or shelter that seldom rises above the ground story, and not a few of our town halls and assembly rooms have insignificant entrances. The French architects give considerable dignity to their main doorways, either by columnar ordinances or massive pediments supported by sculptured corbels and trusses. The entrance ought at least to be commensurate with the size and scale of the facade, and if we cannot have a portico we can attain to it by emphasising the entrance part of the front. It may even be carried up to the full height of two or more stories, and made to form a prominent architectural feature. We have spoken of scale of parts, by which we mean a degree of largeness to the fenestral treatment and details that will at once proclaim to the casual observer the official or civic dignity of the building. These matters are only the external expression of plan, and should be as obvious to the eye as the arrangement is to our sense of fitness and security.

SEASIDE TOWNS.

A MODERNISING spirit pervades everything, from the shape and design of the household furniture to the plan and buildings of our towns. The old order everywhere gives place to the new. Go where we will the note of newness is seen breaking discordantly upon the old, and we find this state of things very apparent in many old seaside towns, where crowds of visitors yearly spend their holidays. Several of the most frequented towns upon the south-eastern coast are in this condition of change. We see lines of residences of red brick extending along the sea front, or climbing up the hills at the back of the town, often with very little regard to contours, harshly cutting hill-sides by their spurs of cross streets. The older parts of the neighbourhood lie probably in a hollow, as they do at Hastings and Folkestone, the builders of which did not think of future extension. The streets, as usual, were never made any wider than the exigencies of the time required, and of this peculiarity the more ancient parts of the towns named, and those of Dover, Margate, and Ramsgate afford instances. But the modern builder does not stop at steep activities, but seems to delight in running straight lines of streets right up the hills, quite regardless of their steepness, and in cutting them across the town. The beauty of prospect is gained thereby, and the modern citizen, accustomed to large level towns, prefers to reside on such slopes, to enjoy the greater salubrity of the air, and the health-giving qualities of elevation they afford. Sanitary conditions did not weigh much in the old time. If a slight fall could be obtained to the beach, that was thought sufficient; but the modern dweller values the advantages of natural drainage, and therefore the steep gradients are preferred. The advantages of elevated sites, air and sunshine are esteemed; they have been to some extent modern discoveries, for our forefathers, who were contented with hollows between hills, streets narrower, and cosy dwellings, would appear not to have valued them as sources of health.

The modern spirit has shown itself in taking advantage of elevated sites, if rather ruthlessly tampering with the profiles of hills and cliffs. As a general rule the moderns have created a wide new row of houses in a series of horizontal step-like

terraces parallel with the coast-line, as we find at several seaside towns—Brighton, Hastings, Dover, &c.—but in a few cases, as at Folkestone, the large residences have been built in rows at right-angles to the escarpments facing the sea, so that from the sea or lower levels one sees the palatial ends of blocks running inland, in some cases facing spacious squares or streets. A very handsome effect is the result of this arrangement, and the profiles of the hills are not marred by the rigid lines of roofs and chimneys. Again, the aspect of the main fronts of the houses are easterly and westerly if the coast faces direct south, and so pleasant rooms are obtained. At Dover it is remarked that some moving spirit contemplating making a New Dover on the high downs to the east. Such a proposal is a natural one, and it will only be following the precedent set by other seaside resorts. If there is any prospect of such a transformation, the greatest vigilance must be exercised by the local authorities to prevent the spoiling of the natural beauty of the historic cliffs. What would be more destructive than to make step-like terraces facing the sea, or crowning the summit with big hotels and boarding-houses? We are not quite sure of how the inhabitants of Folkestone and East Cliff might regard the harbour improvements. The piers and breakwaters will cut off some part of the open sea view. All these towns thrive by their open and unrestricted view of the Channel, and to take away the stretch of sea and to turn the boisterous waves into a smooth harbour will hardly be considered an improvement from a holiday seeker's point of view. But then commercial and naval requirements always mar natural beauty, and the inhabitants cannot have both.

Many improvements have been made at Dover, and many more are in contemplation. Sir William Antiquaries has great future for the port, as we have all heard, by making it a port of call for the Hamburg-American Line. Towards a great naval station it is making considerable progress; but its unique situation as being nearer to France than any other town will give it a position unrivalled in the future. A subway is to be made from Sandgate-street to the Admiralty Pier to facilitate traffic, for which powers have been obtained. The beginning has been made to the formation of a pleasure town by the reclamation of the foreshore, a considerable step towards which has been made by Sir W. Pearson by the construction of the grand promenade, which at present sweeps round the eastern cliffs of the town. Visitors to Dover know what this part of the town was some years ago. The base of the chalk cliffs forming the foreshore was under water, and was impassable during high tides, and the terraces of houses nestling under the cliffs where they are highest by no means added to the beauty of the town at this point. These will doubtless soon give way to a fine sea-frontage for building, the one hope being that nothing will be done to mar the beauties of the noble cliffs by long straight lines of roofs. The fine promenade already finished claims a few hundred feet of seashore, and the concrete and granite-faced wall will secure the cliffs against further inroads of the sea—a consideration of no small moment. Then the national harbour works must not be overlooked. Huge blocks of concrete about 7 ft. by 6 ft., and 5 ft. deep on the average, are being deposited. Some of these are faced with stone, hammer-dressed in courses, and the works have made considerable progress during the last two or three years. The Admiralty Pier extension forms the western arm of the great national harbour. This arm projects at an angle from the head of the old pier in a south-easterly direction, and thus will protect the harbour from the fury of south-westerly gales.

The new promenade pier is an accom-

plished fact; as to its design from an æsthetic point of view we cannot say much; the plan, used for concerts, is not very pleasing externally. In its plan and profile against the sea it is somewhat commonplace, and no doubt the designer had to keep within certain limits of cost; there is a want of play and variety of skyline. Internally, however, it makes a satisfactory room for sound. The roof is simply composed of semicircular wrought-iron ribs springing from the floor, the orchestra end being a semi-oval apse in shape, with angle-iron ribs meeting at the ridge. Between the iron ribs the roof is boarded, stained, and varnished. A polygonal-shaped room beyond the apse forms a very satisfactory room for a pier promenade in the shape of a reading-room that can be used in wet weather, and at the extreme head of pier there are at each corner small kiosks as shelters from the wind. The deck floor of the pier is boarded, the boards being laid crosswise, which way is we think better than lengthwise, the latter method forming a very slippery surface in wet weather. The corporation electric tramways are well patronised. These and other improvements are helping to make Dover a residential resort. The old streets show many new buildings, and the extension of the town from Market-square eastwards has given the opportunity for erecting several new buildings in the modernised brick and terracotta style. Biggin-street and High-street are important thoroughfares, and many new buildings of a commercial character are to be noticed on their route. The town has extended in a north-westerly direction, owing to the steep cliffs on the east and west of the town; but we cannot say that the architectural progress of the place has kept pace with the public improvements.

Local building materials are used with much effect in the Kentish towns. At Dover, Folkestone, Sandgate, Broadstairs, &c., the red brick, which forms the staple material is of a deep subdued colour, and in the best residences is of a superior description. With it is combined "rough-cast" or stucco in the upper stories and gabled parts, the latter being put into panels between timber-framing, or what in some cases are mere boards to imitate timbers. The effect is picturesque at least. Earl Radnor's house and the new Radnor estate on the Sandgate side of Folkestone are composed chiefly of red brick and half-timber relief in the upper stories, and the roofs are tiled, not slated. These materials combine together and form the least objectionable kind of building, especially when the detached and semi-detached plan is adopted, as there are no disfiguring straight sky lines, which spoil half the buildings in some towns. On this estate, which lies between Sandgate-road and the sea, the houses and hotels are chiefly detached blocks of red brick and terracotta, the latter employed in the windows and bays. Gothic of a Domestic type is adopted in many of these new houses, though the Renaissance style finds favour in the larger buildings. The half-timbering is sometimes confined to the upper story. In one large four-storied block a group of gables of bay and dormer windows break the high-tiled roof, and the fronts of these have black-stained timbers of ornamental design inclosing stucco panels. The lower stories are of red brick. Bargeboards are largely used, and are of massive scannings. On the Sandgate-road several villas have been erected: some of them have high-hipped roofs of red tiles, relieved by white painted dormers and window frames; in others we see rough stucco-work inclosed in panels of red terracotta work or cement. On the east side of the Hotel Métropole which faces a group of gables of flats is being completed of five stories. The red brickwork is relieved by terracotta in the windows and mullions. The style of treatment is Modern Renaissance of a commonplace order. This

block is in a line with the big hotel, and competes with it.

The architectural student will discover in this and other towns three developments of modern architecture. We have, first, the Italian revival in stucco of about half a century or more ago, seen in such residences as those facing the Lees in Plymleigh and Clifton-gardens, well-built blocks faced with stucco which have stood well the exposure to the sea; next we have the style of houses of more recent date of Gothic taste, built of white or yellow bricks with red-brick dressings, with cut ornamental Gothic bargeboards in the gables; and, thirdly, the later development of red brick of a more unostentatious type which we have described. We notice the same order of progress in the towns of Dover and Ramsgate, where red brick and tile are predominant in the new buildings. A very successful modern red-brick church is the Roman Catholic church of St. Aloysius in Guildhall-street, Folkestone, designed, we believe, by Mr. Leonard Stokes. The gabled front to the street is broad and effective in treatment. Wide, massive piers of some depth flank a bold and deeply-moulded gable window of stone, and there is a picturesque cupola, bell-turret over one corner, giving a quaint Flemish character to the style, which we expect the of the ancient parish church of St. Mary's, the churches are few and uninteresting.

A local material that is largely used for the boundary-walls of houses is Kentish rag in random courses, which is coped in some cases with terracotta. Of course, flint is seen in a great many buildings, especially churches; it makes an excellent and durable wall when employed with bonding courses of brick or stone. No one visiting this part of Kent will omit to notice the fine old church at Hythe (one of the Cinque Ports), restored by the late Mr. Street, with its noble Early English chancel, fine altar, nave, and mosaic pavement, which formed the skulls and bones of slaughtered Danes and Britons; the old town-hall and market-place, and several interesting examples of old brickwork. On the Canterbury line four or five miles from Folkestone is another interesting old church—that at Elham, built of flint and rag, but in a disgracefully dilapidated state internally. It has a Perpendicular nave and double aisles, and a fine Early English chancel that has suffered from restoration. The chief features of interest in this church are the rectangular-shaped piers with which the edges splayed, and the painted diapers at the springings of the arches, also the painted running borders of the "key" pattern, and foliage in the soffits of arches. There is a good flat open-timber roof over moulded tie-beam and nave, with curved wall-brackets; the aisle roofs are also ancient, but in a state of decay, and the bosses to wall springs are grotesque carved heads. At the western end the ground is covered by matting, as the floor has actually decayed—a painful instance of neglect. There is a fine tower at the west end of nave opening into it by a massive arch of good design, but of simple splayed section. Over is a short slate spire, and the church is a very picturesque object from the railway. In the village is to be seen a row of timber cottages with very interesting old carved eave-brackets under a tiled roof, also a carved string at the lower edge of upper projecting story. The moulded brickwork at the end of the panelled doors and the mullioned windows are genuine untouched features. Sandwich and Deal contain many quaint examples of brick-and-flint work worth a visit by tourists in this locality.

But it is mainly of the modern work we now speak. In the towns that we have largely entered for visitors and amusements, a superficiality is the main characteristic. The café development in some towns like Margate has increased the desire for showy

fronts and plate-glass and cheap decorative effects, and even in some of the more exclusive towns, the popular restaurant is forcing its way into the more reserved and private streets, with all the meretricious aids of glass, gilt enrichments, and draperies. We see even an attempt to reproduce the open-air cafe of Boulogne and Paris at the back end of the premises. The boarding-house is another strong feature of the seaside town, and the general idea seems to be to make it as much like a private villa or dwelling-house as possible; of course the bay window and the balcony play an important part in the design. As a matter of fact, many of the large and better-built residences are converted into boarding establishments in most of these towns, so that the visitor is astonished to find streets of what appear to be private mansions chiefly composed of boarding establishments and private hotels. The questions occur: Are these buildings in all instances suitable for boarding-houses? Are the bedrooms properly arranged and supplied with proper conveniences? Are the partitions fire-resisting? Are the staircases and exits spacious enough in cases of emergency? Lastly, are the sanitary fixtures and ventilating arrangements as good as they should be? We are not sure that those things are quite as they ought to be, or that the local building regulations are carried out. Some years ago many lodging and boarding-houses in large seaside towns were condemned for imperfect sanitary arrangements. Matters are better now; but there is still room for improvement, and every boarding-house or lodging-house should be officially licensed. We are not certain whether they are so guaranteed. The hotel is another important element in the seaside town, and should be equally made subject to local regulations. Architecturally, these buildings have a stereotyped look about them, and though large sums of money have been expended on them and their internal decoration, there is a lack of homely comfort. They are generally worked by companies on a purely commercial basis, in which individual comfort and convenience are not considered.

HOW TO ESTIMATE, OR, THE ANALYSIS OF BUILDERS' PRICES.—XXIII.

By JOHN T. REA, F.S.I., SURVEYOR, War Dept.
MILL CHARGES FOR SAWING.

PER TIMBER.			
Fir timber under 12in. square, 3 cuts to the load of	s. d.		
5ft. cube	1	6	7
Ditto 12in. and over, 4 cuts ditto ditto	2	6	
Timber sawing per 100ft. super.	4	0	
Cross cuts, each	2	3	1
Cutting 4in. arris rail per 100ft. run	2	0	
Ditto 6in. ditto	2	3	
For scantlings, 1in. and under, per ft. ran	2	3	
Ditto above 1in. ditto	0	0	
Charge, per load of 50ft. cube, per mile	1	0	

BATTENS, DEALS, AND PLANKS.

Length.	Battens.	Deals.	Planks.
ft.	Per doz. cuts.	Per doz. cuts.	Per doz. cuts.
6	s. d.	s. d.	s. d.
7	1	6	2
8	1	6	2
9	1	6	2
10	1	6	2
11	2	0	3
12	2	3	3
13	2	4	3
14	2	4	3
15	2	4	3
16	2	4	3
17	4	0	4
18	3	3	4
19	3	3	4
20	3	3	4
21	4	0	5
22	4	0	5
23	4	0	5
24	4	0	5
25	4	0	5
26	4	0	5
27	4	0	5
28	4	0	5
29	4	0	5
30	4	0	5

Flattening, 3in. and under	per 100ft. run	s. d.
Ditto 4in. ditto	"	1 0
Flattening planks, 12in. to 15in. wide, per 100ft. sup.	"	1 1
Ditto 16in. to 24in. "	"	2 6
	"	3 0

Malagasy, Honduras	per 100ft. super.	s. d.
	under 21in. deep	7 6
Ditto, Spanish	"	6 3
Teak	"	"
Yellow pine	"	4 6
Pitch-pine	"	6 0
Walnut	"	6 0
American ash and whiteoak	"	6 0
American oak, elm, and black walnut	"	7 0
English oak, beech, elm, ash, and chestnut	"	7 0
Cross-cut, under 11in.	each	0 9
Ditto above 11in.	"	0 9
Charge charged on seven cuts and under at 7s. 6d. per		

The foregoing prices for sawing include collection from docks and delivery after sawing within three miles of mills, except the extra charges for carriage and landing rate.

FLOORING AND MATCHBOARDING.

Labours, all at per 100ft. super.	11in. under.	1 1/2in. under.	s. d.
Sawing and planing	2	3	2 6
Ditto ditto planing and grooving	1	6	3 0
Ditto ditto both sides	3	9	4 0
Ditto ditto ditto and matched	4	6	4 0
Ditto ditto ditto plan matching	3	3	5 6
Ditto ditto matched and beaded or chamfered	3	9	4 0
Ditto ditto ditto both sides	1	6	1 9
Planing boards, when sawing charged separately	1	6	1 9
Prepared boards at yards, grooved or beaded	1	0	2 0
Ditto ditto matched only	2	0	2 0
Ditto ditto matched and beaded	2	3	2 6
Ditto ditto rebated and beaded only	2	6	2 6
Sawing, planing, and thickening	2	6	2 6
Ditto ditto ditto and grooving	2	6	2 9
Stacking 3d. per square extra.	"	"	"

All the foregoing are nominal sawmill calculations, and are liable to modification or discount. For various deals of rates it is best to apply to the respective sawmills.

The quantity of sawing required, as previously stated, depends upon whether the scantlings are obtained from exact imported sizes, from deals, or from balk timber. The amount of sawing also varies with the class of structure, for it decreases with the increase in the size of the timber.

Learning shows, by a series of calculations from actual buildings, that an average of some 360ft. super. of whole sawing is required per load of 50c.ft. if the scantlings are cut out of balk timber, and that only 145ft. super. are required if the timber is obtained from deal, or imported sizes which need little conversion.

TIMBER PER LOAD.

Carpenter's work, such as girders, joists, plates, &c., is executed partly from balk timber and partly from deal timber, and the basis of calculation would be by the load of 50c.ft. Joiner's work, on the other hand, is generally converted entirely out of deal, with the St. Petersburg standard as the usual criterion.

For the former it is usually specified that "the fir timber, unless otherwise described, to be from Memel, Rigra, or Dantzie, or of such approved kind as may be ordered. The quality to be equal to that known as 'best middling,' to be free from large or loose knots, and other defects." The timber is also specified to have "all sides square, and free from any angles." As before mentioned, the builder can often get the same sizes and better stuff out of imported scantlings or deal, which need little or no sawing, and so evade that labour.

The average prices per load of 50c.ft. of squared timber, bought by the contractor at the best deck sales, are as follows:—

	£ s. d.
Best Dantzie fir timber	3 15 0
Best middling ditto	3 10 0
Good middling ditto	3 0 0
Pitch-pine	3 10 0
American red pine	3 0 0
American yellow pine	5 0 0
Small Swedish fir	1 12 0
Fine ash or oak	3 10 0
Dantzie and Memel oak	3 10 0
Riga white oak	5 0 0
Quebec oak	3 10 0
Teak, Burmah	15 0 0
Greenheart	8 0 0

As before mentioned, there is no landing-rate charge for balk timber.

After purchase the balks are taken to the mills, shabbled all round, then sawn up into the sizes required and cross-cut. The waste of stuff per load in shabbling averages 30 per cent., ditto in sawing five-square, from saw-kills, 7½ per cent., and ditto in cross-cutting 2½ per cent. Linton says: "Add to the price at the yard £1 per load for sawing, cutting," but this is more than a yard of thumb, and seems insufficient. Bearing in

mind previous statements, the particulars of the total cost would then appear:—

ANALYSIS OF COST OF BALK TIMBER.

	£ s. d.
One load of 50ft. cube best middling Dantzie	3 10 0
Cartage from docks to saw-mills	0 4 0
20 per cent. waste on £3.10. for shabbling	1 10 0
7½ ditto ditto ditto sawing five-square	0 5 3
2½ ditto ditto ditto cross-cutting to length	0 1 9
360ft. super. of whole sawing for scantlings at 4s. per 100ft. sup.	0 11 5
Cost per foot cube, delivered on site	50 5 16 5
Net cost per foot cube, delivered on site	0 2 4

The profit is added on each detailed item's further on.

If, however, the builder can get all his sizes for carpenter's work out of deal timber or imported scantlings, the labour of sawing would be largely saved, and the analysis would be as follows:—Suitable deals would cost about £10 per St. Petersburg standard of 165ft. cube, which is equivalent to £3.0s. 7d. per load of 50ft. cube, or a little under 10 per cent. cheaper than balk timber. The waste will also be less.

ANALYSIS OF COST OF DEAL TIMBER.

	£ s. d.
1 load of deal at £3.0s. 7d. or £10 per standard	3 0 7
Cartage from docks to saw-mills	0 4 0
20 per cent. waste on £3.0s. 7d. for cross-cutting to length	0 6 6
145ft. super. of sawing for conversion at 4s. per 100ft. super.	0 5 9
Cost per foot cube, delivered on site	50 31 10 2
Net cost per foot cube, delivered on site	0 1 5

As a matter of fact, the carpenter's work is derived from both balk and deal timber, and the proportion of each will depend on the size of the building. It would, therefore, be a great convenience to evolve a price which would embody both, and which would be applicable to most cases. This proportion would be approximately one-third balk and two-thirds deal, and such a price may be ascertained thus:—

2s. 4d. price of balk timber by 1	s. d.
1s. 3d. " deal " by 2	0 11
Cost per ft. cube delivered on site	1 8 1

Timber merchants will supply whole or half fir timbers in various lengths up to 45ft. at a standard rate (say, 1s. 6d. per ft. cube) if the average length does not exceed 27ft. Should the average of any lot exceed 27ft. by any given number of feet, that number will be the number of shillings per load of 50c.ft. extra charge which will be made. Say the average length is 34ft., then the excess is 7ft., and the price is 7s. per load dearer than if the average had been 27ft., or under. Approximately the extra charge is 3d. per foot cube on all the timber for each cubic foot the average is in excess of 27ft.

DEALS PER STANDARD.

The carpenter having supplied all the rough and heavy woodwork which is generally hidden, the joiner executes the lighter framed stuff, fittings exposed to view—such as doors, windows, &c.—which are prepared, ready for fixing, at the workshops. Consequently joinery should be made from the best material. Nowadays the carpenter is only regarded as being capable of doing the rough kind of work—such as joisting, roofing, centres, &c.—prepared at the site. On the contrary, the joiner is a more skilled workman; but is threatened by machinery and machine-made timber to be transformed into a wood-fitter. Like other trades, the joiner's is often sub-led.

Specifications run "The deals, excepting when stated to the contrary, are to be yellow Christians (Swedish), best Petersburg, or Archangel, of the first quality, or Baltic red, as may be ordered, and equal in quality to first-class goods of the best Russian or Swedish shipment, and to be well seasoned, and supplied in such lengths and of such breadths as shall be directed."

For really high-class joiners' work there are no better deals than the best St. Petersburg, as sent over by Messrs. Gronoff; the best Archangel, as shipped by a firm like Brundt's; or the best Onega, as supplied by the Onega Wood Co. The most useful of them will be the St. Petersburg standard of 120 deals, 12ft x 11in. = 1,320ft. super of 1½in. thick, or 165ft. cube. Other sizes are reduced to this criterion; but as deals are sold in various other ways, the matter is so confusing that tables for timber calculation are almost impossible to draw, or the estimator must work out the sum on paper.

The best deals cost at the dock sales on an average:—

Swedish	per standard	£ s. d.
Best St. Petersburg	"	13 0 0
Quebec yellow pine, first bights	"	12 0 0
Canada spruce, first	"	10 0 0

There must also be taken into account 3s. 6d. for landing-rate on goods for immediate removal and sawing, 1s. 6d. for loading, 10s. for cartage, cost of sawing into thicknesses, and 10 per cent. waste in sawing and conversion. The cost of sawing would depend upon the thickness and length of boards required, and may be kept accurate if converted into 1 in. boards. If wanted, this would mean two cuts down the breadths of 120 planks, 12ft. by 11in. by 1 1/2 in., or 120 x 2 = 240 cuts, 12ft. long by 11in. wide = 240d., at 3s. 6d. per dozen.

ANALYSIS OF COST OF DEALS.		
standard of 1,321ft. super. of best St. Petersburg	£ s. d.	
burg deals	13 0 0	
Landing-rate at docks	0 3 9	
Loading at ditto	0 1 6	
Cartage from docks to sawmills	0 10 0	
Sawing into 1 in. thicknesses, 2,200d. cuts at 3s. 6d. 10 per cent. waste in sawing and conversion	1 6 0	
on £13	3,960 18 11 3	

Net cost per ft. sup. 1 in. thick, delivered on site 0 11

In this case, as three thicknesses were cut out of the standard thickness of 1 1/2 in., the divisor stood 1,320 x 3 = 3,960. By altering this divisor in a similar manner the prices per foot super. for other widths and thicknesses can be easily calculated. If there is a large quantity of sawing the sawmill owners will include the cost of cartage from the docks in their rates, and collect the timber themselves, as well as deliver it. And if the builder keeps the wood two years or more for seasoning he will have to insert in the foregoing analysis the interest for that time on its outlay, or else reckon it amongst his establishment charges.

"It is necessary that the student of estimating should exercise himself in such questions as how to obtain the cost of timber sold by standard measure. He should, for instance, be able to find out the value of deals at the price per standard.

Let us take an example:—
1 std. 16 deals at £10 10s. per standard.

The deals will always be found out to work at 2 pence to each standard pound. Thus in £10 10s. the price of a standard, there is just 21 pence which, when multiplied by the number of deals over, 16, will give their value; as, for example:

£10 10 0 per standard	
2	
21 pence	
16 deals	
12/960 pence	
28s. cost of 16 deals	£ s. d.
Cost of one standard	10 10 0
Cost of sixteen deals	1 8 0
Total cost	11 18 0

Again, to find the number of lineal feet in a quantity of any scantling, multiply the thickness by width and divide 23,760 by the product, viz:—

Suppose we wish to find the number of lineal feet in a standard of 2 1/2 in. by 3 in., then—

$$2\frac{1}{2} \times 3 = 7\frac{1}{2}, \text{ and } 23,760 \div 7\frac{1}{2} = 1,881\frac{1}{2} \text{ lineal feet.}$$

If we require to obtain the value of any number of feet in a standard at £12 per standard, say 24ft. of 3 1/2 in. by 2 in.—

$$2\frac{1}{2} \times 2 = 5\frac{1}{2}, \text{ and } 23,760 \div 5\frac{1}{2} = 8,571\frac{1}{2} \text{ shillings} = 8s. 5\frac{1}{2}d.$$

In this case the product will give shillings in the under-sixths place and fractions of shillings in the tens and units place. By adding the difference between the £12 standard and any other price, the value of any number of feet at any price per standard may be obtained. Of course, most price-books give tables of the value of running feet. A table of the equivalent prices per cubic foot and 4, Petersburg standard is especially necessary in pricing."—Author of "Estimates."

PLANING.

Specified sizes usually imply, unless otherwise stated, those sizes less the weight caused by the rough faces. If finished sizes are mentioned, then rough timbers of larger sizes may be used, taken to allow for the loss in planing, though in hills of quantities it is generally specified that: "In taking dimensions of joists,

work, 3 in. will be allowed for each wrought face." For finished thicknesses in deal add 1 d. per foot super. to prices for nominal thicknesses. Boarding is invariably machine-planed at the sawmills, and only requires subsequent smoothing, while timbers are bought rough by the builder, and afterwards planed, as may be necessary, by his carpenters.

For prices of machine-planing, grooving, &c., see page before. This is usually assumed at 3 d. per foot super. for fir or pine, though when taken by the larger dimension of per square the valuation is much less.

When planing is done by hand, a carpenter can execute 100ft. super. per day of 10 hours = 10d. per hour. That is, 100ft. super. cost 8s. 4d. = 1d. per foot super.

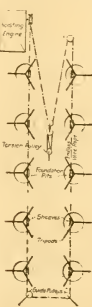
If performed by machinery, and smoothed or finished by the carpenter, allow 3 d. per foot super. for straight planing.

Planing on hardwoods is one-third more than on fir.

(To be continued.)

A NOVEL HOISTING PLANT.

A ROPE drive working a series of excavating buckets in foundation pits has been successfully used in preparing foundations for the new Marshall Field Building in Chicago. The new building was torn down to the street level, the first floor being left temporarily for working



platform, below which rows of pits are being sunk through a stiff clay for the concrete piers of the new interior steel columns. There are eight pits, about 20ft. apart in rows separated by distances of 20ft.; the pits are being carried down nearly 100ft. to solid rock. The pits are lined with wooden staves 6ft. in length placed in position, after which interior steel hoops 7ft. in diameter are put in place, this being accomplished as workmen excavate the pit with picks and shovels. A hole is cut in the working platform over each pit, and over the hole is a small timber tripod with a horizontal framework connecting two legs, arranged to support a short horizontal shaft. On the outer end of this is a grooved sheave or sheave about 3ft. in diameter. On the inner end of the shaft, inside the legs of the tripod, is a capstan head. The sheaves in each of the tripods in each row are lined up so as to be in the same vertical plane, and around each is taken one or two turns of an endless wire rope operated continuously by a hoisting engine placed upon the working platform. By means of guide pulleys beyond the tripod most distant from the hoisting engine, the rope is carried across to the adjacent row of tripods over similar pits, then towards the hoisting engine, operating all of the tripod pulleys in the second row. Pulleys fastened to small uprights on the floor serve to carry the rope. The tension pulley is operated by a horizontal hoisting tackle and serves to keep the proper tension upon the rope drive. From the top of each of the shaft tripods a hoisting tackle is suspended, and when the bucket of spoil is ready to be hoisted it is fastened by a hook to the rope, the other end of which is carried over the pulley at the top of the tripod, and an attendant, upon the working-floor level, takes two or three turns of the fall line around the capstan head, and

pulling off the slack, hoists the bucket. Two- or fourteen pits at times served simultaneously and continually by one hoisting engine. Messrs. D. H. Burnham and Co. are the architects, and the T. Nicholson and Sons Company, of Chicago, are the contractors for the foundations and arranged the plant described.—*Engineering Record*.

THE PROPOSED CATHEDRAL FOR LIVERPOOL.

MR. THOMAS W. CUTLER, F.R.I.B.A., has written to the *Liverpool Mercury*, regarding the proposal to again invite designs in competition for the new cathedral for Liverpool, and controverting the assertion which has been several times repeated in recent correspondence, that "no actual award was made" by the referee, the late Mr. Ewen Christian, in the competition of fifteen years ago. He points out, and his statements can be confirmed by reference to our past volumes, that "in the first instance, the Liverpool committee invited architects generally who wished to enter the competition for the Cathedral to send in portfolios of their sketches and designs of work they had done to the committee for their consideration. In response, some 130 gentlemen (more or less) sent in portfolios. From these 130 the committee selected four to prepare designs for the Cathedral—Messrs. Bodley and Garner, Mr. James Brooks, Mr. William Emerson, and Mr. J. L. Pearson, since deceased. Mr. Pearson did not send in a design, the remaining gentlemen sent in three designs. The late Mr. Ewen Christian was appointed assessor, and in due course sent in his report (which was his award) to the committee. In the summing up of his report he states: 'Mr. Emerson's is, in my opinion, on the whole the best.' This report was published. Each competitor was paid £300 for his work, which, of course, did not half cover his out-of-pocket expenses. From unavoidable circumstances, the matter was allowed to drift for 15 years, through no fault of the architects. Now there is every probability of the Cathedral being built. A new site has been selected, and more than £140,000 has already been subscribed, and the committee are now reconsidering who the architect shall be who is to build the cathedral." Mr. Cutler points out that Mr. Aston Webb's design for the Victoria and Albert Museum was in abeyance for seven years; but the Government never thought of a new competition when they were ready to proceed. In conclusion, Mr. Cutler remarks: "The fact that the committee have been unable to build the cathedral, for which they asked certain distinguished architects to compete 15 years since, is surely no reason for behaving unfairly, and now when the committee propose to begin the work, clearly the only honourable course is to give the commission to the author of the (best) successful design."

THE A.A. "BROWN BOOK."

THE Calendar, Report, and List of Members of the Architectural Association, so long familiarly known to students from the tint of its paper cover, is now published in a new form. It consists of some 184 pages, the feature of most general interest being the Report of the Committee for the Session 1900-1901. The committee state with evident gratification that the 54th session, which terminated on May 31, 1901, has been a prosperous one in every respect. The membership has increased by 100, the increase, and financially the session has been a great improvement over previous years; 116 new members were elected, 6 were reinstated, and losses by death, resignation, and other causes amounted to 37, the total membership on the last day of the session being 1,376. The committee regret to record the death of the following members:—H. C. Boyes (President 1876-77), J. M. Brydon (Vice-President R.I.B.A.), Arthur Cates (Hon. Secretary A.A. 1852-55), W. L. Cock, W. F. Coombs, E. D. Ford, D. Good, and J. A. R. Inglis (Scots Medalist 1897). The education committee has held nine meetings, and after most careful deliberation a scheme for the establishment of day classes was formulated, and on March 8, 1901, a special general meeting of the Association was held to discuss the scheme which had received the sanction of the committee. The proposal was unanimously approved, the committee trust that the architects will support the day school by aiding their pupils to attend the studio lectures during their pupillage. The thanks

of the Association are, due to the members of the educational sub-committee, whose assistance in framing the details of the scheme was most valuable, and also to those gentlemen who have kindly guaranteed certain amounts in case of a financial loss on the first year's working of the school. An advisory council of well-known architects has been formed to assist the committee in this work. The Royal Institute of British Architects has agreed to contribute a grant of £100 towards the educational work of the Association. This has been of great assistance, for although the amount of students' fees exceeds the instructors' fees, rent and other expenses have to be provided for. The premises sub-committee, after mature deliberation, arrived at the conclusion that it is impossible to take advantage of any desirable building sites that may offer themselves until a substantial premises fund has been formed. It is therefore proposed to take steps towards this end. The office and library have been transferred to the front room on the ground floor, and the former office has been redecorated and fitted up as a committee-room. This arrangement provides better accommodation for the Office staff and library. The report refers to the exhibition of studio work, to the annual excursion, dinner, and conversation, and to the meetings held fortnightly during the past year, all of which were duly described in our columns at the time. With regard to the educational work, 224 individual students attended the studio and evening classes. These numbers show an increase in Division I. By the courtesy of the Technical Educational Board of the London County Council, a number of students attended demonstrations in lead-work and masonry. The statement of accounts shows, as total receipts, the sum of £2,177 1s. 2d., and that a balance of £317 10s. 11d., being excess of income over expenditure, has been carried to the premises and general fund account.

THE ARCHITECTURAL ASSOCIATION PRIZE LIST.

THE following are the awards of prizes by the Architectural Association for the past session, 1900-1901:—

- A.A. Travelling Scholarship, value £25, and bronze medal, J. E. Forbes, second prize, value £5, L. G. Delmar, A.A. Medal, value £10 10s., G. Drysdale.
 Minister Fletcher Bursary, value £10, J. E. Forbes, and I. F. Green, hon. mention, A. C. Bissell.
 Andrew Oliver Prize, value £5 5s., D. Anderson and I. F. Green, joint prize.
 Architectural Union Company, not awarded.
 Lewis Prize, G. H. Lever.
 Division I.—E. Gunn, A.A. Scholarship, value £15 10s., H. F. W. Enzor, prize value £1 10s.; H. F. W. Enzor, G. Walker.
 Division II.—Construction, D. W. Stewart, prize value 10s. 6d.; Time Sketches, C. M. Stewart, prize value 10s. 6d.

ORDER OF MERIT.

- I.—Greek and Roman Orders:
 E. Gunn, bronze prize, C. J. Goodwin, W. S. Dakers, Elementary Construction, H. E. Rider, bronze prize, T. A. Dale, E. Gunn, English Architecture, E. Gunn, bronze prize, T. A. Dale, C. J. Thompson, Medieval and Renaissance Architecture, E. Gunn, bronze prize, E. Gunn, H. E. Rider, Elementary Physics, Formulae, and Calculations, D. Anderson, bronze prize, E. Gunn, H. E. Rider, Plans and Sections, E. Gunn, bronze prize, C. J. Goodwin, A. F. Benjamin.
 II.—Materials, their Nature and Application:
 H. Greenly, bronze prize, W. H. W. Enzor, bronze prize, W. L. Enzor, bronze prize, P. J. Westwood, bronze prize, H. Greenly, bronze prize, W. L. Enzor, bronze prize, K. D. A. Robinson, Ventilation, Lighting, and Heating, L. W. Enzor, bronze prize, H. Greenly, G. Walker, Professional Practice, H. Greenly, G. Walker, Monumentation, Land Surveying, and the Surveying of the Sea, P. R. Smith, bronze prize, N. C. Smith, Elementary Class of Design, Prize value £5 5s., and bronze medal, E. O. Theobald, certificate, A. Winnett, certificate and medal, E. O. Theobald, bronze class, A. Durr, pass for modelling class, A. A. Fisher, E. Brintwood Muir.

THE REGULATION OF ARCHITECTURAL PRACTICE IN CALIFORNIA.

A FEW months ago, a law was enacted in California to regulate the practice of architecture, and under its provisions a State Board of Architecture has been formed and rules adopted for the guidance of the members of the profession in building and licensing. The law provides that the Board, all appointed by the Governor of the State, shall consist of five members, residents of the northern part of the State, and the other five of the

southern part, and all must be members of a "chapter of the American Institute of Architects or of some similar institution or association of architects." The term of office is four years, except in the case of four members of the original board, who have been appointed for two years. The members serve without compensation from the State, and the expenses are raised by fees collected from applicants for certificates to practise. The officers of the present Board are as follows: President, Octavius Morgan, Los Angeles; vice-president, Seth Babson, San Francisco; secretary and treasurer, Merritt J. Reid, San Francisco; assistant secretary and treasurer, Fred H. Koehring, Los Angeles.

The committee, purporting the State is divided into Northern and Southern Districts, with offices at San Francisco and Los Angeles, respectively. The members from the two sections, five from each, are grouped into District Boards, each having a seat distinct from that of the whole Board. The latter meet once a year regularly, and on other occasions at the written request of four members, and after 20 days' notice. The District Boards meet at their offices on the last Tuesday of January, April, July, and October of each year for the examination of the applicants for certificates to practise, and at such other times and places as they may elect.

Any person is entitled to such an examination on payment to the District Board of a fee of \$500. If the examination is passed, a further fee of \$500 must be paid to the secretary for an official note of the fact, addressed to the Secretary of State. On the presentation of this note to the latter officer, and payment to him of another \$500, the candidate will receive a certificate or license to practise, containing a statement of his full name, birthplace, age, and the District Board before which he appeared.

Any architect in good standing, who can prove to the satisfaction of the board of the District in which he resides that he was practising his profession on the date of the passage of the Act, will be granted a note of this fact without any examination on payment to the Board of \$500, provided the application is made within six months of the date of the Act. On receipt of this note, and another fee of \$500, the Secretary of State will issue a certificate stating that the person named is authorised to practise.

Every licensed architect must have his certificate recorded in the office of the recorder of every county in which he practises, the fee being the same as for recording deeds. If a candidate has no certificate so recorded is sufficient cause for revoking it.

The penalty section of the Act establishing this system of licences is, of course, the most interesting feature of the whole scheme. It reads as follows: "After the expiration of six months from the passage of this Act, it shall be unlawful, and it shall be a misdemeanour, punishable by a fine of not less than \$500, nor more than \$5000, for any person to practise architecture without a certificate in this State, or to advertise, or put out any circular, or other thing, or to do anything which indicates to the public that he was an architect; provided, that nothing in this Act shall prevent any person from making plans for his own buildings, nor furnishing plans or other data for buildings for other persons, provided that such architect or person furnishing such plans or data are furnished, that he the person furnishing such plans is not a certificated architect; provided, that nothing in this Act shall prevent the employment of an architect residing out of the State, or of a foreigner, to prepare plans and specifications, for buildings or other structures within the State, conditional, he shall present satisfactory evidence to the Board of the District in which the structure is to be erected, that he is a competent architect, when such Board shall permit such architect a temporary certificate for such employment, upon the payment of a fee of \$500. Architects' certificates issued in accordance with the provisions of this Act shall remain in full force until revoked for cause, as hereinafter provided for in this Act. A certificate shall be revoked for dishonest practices, or for gross incompetency in the exercise of the profession, which question shall be determined by the District Board of the district in which the person whose certificate is called in question shall reside, or shall be doing business; and the person so charged by the District Board, an opportunity having been given the accused to be heard in his own

defence or by counsel; and upon the verdict of at least four members of the District Board, the Board may issue its certificate to the Secretary of State revoking the certificate of the person accused; and the Secretary of State shall thereupon cancel such certificate. And on the cancellation of such certificate, it shall be the duty of the Secretary of the District Board to give notice of such cancellation to the Recorder of each county in the State, whereupon the Recorder shall mark the certificate recorded in his office 'cancelled.' After the expiration of six months, the person whose certificate was revoked may have a new certificate issued to him by the Secretary of State upon the certificate of the District Board by which the certificate was revoked."

All plans issued from the office of a certificated architect must be impressed with a seal having his name and place of business, and the words "certificated architect." A rubber stamp is not sufficient.

Each member of a firm practising in the State must have a certificate.

The rules concerning examinations recently adopted by the Board read as follows:—

The regular class examinations shall occupy not less than two days. One day at least shall be devoted to written examinations, and one day shall be devoted to ascertaining the ability of the candidate to make practical application of his knowledge in the ordinary professional work of an architect, which will include an effort towards ascertaining the qualifications of the applicant in draughtsmanship and also in design, in construction, and in the art of planning and rendering.

A diploma of graduation from the full course in architecture or architectural engineering in any university or technical school, approved by the Board, may be accepted as satisfactory evidence of a competent knowledge of architectural design and construction required for a certificate to practise as an architect in California according to law; provided that in such case the applicant for examination shall present evidence, satisfactory to the Board, to show that he has acquired the ability to successfully apply his knowledge to the design and construction of buildings, and to supervise the execution of work.

The subjects upon which the applicants for a certificate of competency to practise architecture shall be examined, as follows:—1, Demonstration of ability to make application of knowledge in the ordinary professional work of an architect, as follows: 1, merit of investment; 2, planning; 3, construction; 4, design; 5, rendering.

Materials and construction of buildings, eleven subjects, as follows:—Foundations, concrete work, masonry, mortar, brick masonry, structural iron and steel work, carpentry, joinery, sheet-metal work, plastering, painting. Strength of materials, eight subjects, as follows:—Tension, compression, shearing, transverse strain, structural columns, floor beams, girders, trusses. Sanitation, three subjects, as follows: Plumbing, heating, ventilation. Electrical construction as applied to buildings. Supervision of all the foregoing subjects, as applied to buildings.

Each subject of each subdivision shall be graded by the committee on examinations, and the applicant whose grading shall be 75 per cent. or over shall be entitled to a certificate of competency.

The Government of Burma recently adopted a competition design for the proposed High Court building, at Madaya, prepared by Mr. Harris, architect-in-chief to the Madras Government. The authorities of Burma wish, however, for modifications in the design, and have engaged Mr. J. H. Fox, their executive engineer, to "effect a compromise between the three designs to which premiums were awarded," and also to get out estimates with a view to putting the whole in hand as early as possible.

The new vestries which have just been erected in connection with St. Paul's Church, Walsall, were opened and dedicated last week by the Suffragan Bishop of Shrewsbury. The vestries have been built on the design of Messrs. Fox, Fox, and McConnell, of Walsall, and they are in strict accord with the remainder of the church, which was erected from the plans of the late Mr. J. L. Pearson, of B. A. Fox, and they have been built on the site of the chancel was curtailed off and utilised as vestries. This extra space is now opened out, providing about fifty extra seats. The church and new vestries are shortly to be lit with the electric light, and the total cost of the two schemes will be £1,000.

BOOKS RECEIVED.

Ripon: the Cathedral and Sea (by Cecil HALLETT, B.A.), is the twenty-fifth volume of the handy, readable and up-to-date Cathedral Series published by George Bell and Sons. We see that most of these volumes already issued have passed into second editions, and that of Canterbury has attained its third edition. Ripon Minster is not one of our larger or more important cathedrals, and had up to the present time enjoyed a singular seclusion, and a certain coarseness of detail much diminish its attractiveness to the casual visitor who undertakes the cross-country journey to the North Riding; but its history as a cathedral, a monastery, and collegiate church is a long and interesting one, also its architectural and historic only dates from the last few months of William the Fourth's reign. For centuries the architectural history of the minster has been associated with the names of the Archbishops of York, who had their episcopal palace in the town. Nothing remains of the Saxon building except the crypt; but the tower of the central tower, and portions of the north nave and choir show important work by Archbishop Roger de Pont l'Evêque, of Henry II.'s reign, in the Norman Transitional style. The eastern portion of the choir was rebuilt by Archbishop John Romaneus, c. 1290, in a florid styled Decorated style. The most interesting feature in the peculiar style, and two sides of the central tower date from the days of Archbishop Kemp, 1426-52. The central tower has thus the unique distinction of being divided vertically between two very diverse styles—the north and west fronts being Transitional Norman, those to the south and east being Perpendicular. The nave presents similar anomalies, the south side differing greatly from the north, and greatly surpassing it architecturally. The carefully-compiled little work contains a roughly-drawn but useful plan, hatched to show the several states of the building, and fifty-two illustrations from photographs among the most interesting of these being an early apsidal chapel, with later chapel superposed, and the reconstructed angle of the central tower. A comparison of the woodcut of the dignified west front, with two tiers of lights, as it existed before 1862, taken from an old print, with a rather poor and quite inadequate process block of a photograph of Sir Gilbert Scott's east-iron and ill-proportioned single lancets, suggests how much was destroyed forty years ago during wanton restorations. The present east end and gable is also an unfortunate memorial to Scott's taste for rebuilding in what he conceived to be reproduction of Fourteenth Century work.

Oblique Bridges, by FRANCIS CAMPES, F.E.S., London: 3, Ludgate Circus-buildings, E.C.—This theoretical and practical treatise on oblique bridges in stone and brick appeared in serial form in the *Railway Engineer*, and is reprinted with the original diagrams as a thin 8s. volume, being No. 2 of the Railway Series of Textbooks and Manuals. As the author well observes, in no class of structure is accuracy of detail of greater importance than in that which includes built-up oblique arches—an error apparently insignificant at the commencement of the work increases as the process goes on until it affects the stability of the arch. The salient feature in an oblique structure is the form of the bed dividing the courses of material with which the structure is built up. Mr. Campin lucidly and succinctly shows methods of determining with exactness all the dimensions and angles requisite for the execution of the work, and explains in detail the manner applied in working the stones of impost and arch. Two methods of making the necessary calculations for the arch are shown—trigonometrical equations and also those obtained from the properties of right-angled triangles, and both are worked out, showing how closely the results of the two systems agree.

Mr. G. L. Gomme, clerk to the London County Council, has addressed a circular letter to each of the Metropolitan Borough Councils, inviting an expression of their views whether the County Council should promote legislation to compel owners of property in insanitary areas to declare their property.

The total outlay of the Public Works Department of India in restoring buildings in Assam, damaged or destroyed by the great earthquakes of 1897, amounts to Rs. 41,12,000 up to the end of 1899-1900. This sum does not include the cost of extensive repairs to the bridges in the province of Assam, which suffered most from the earthquake.

PROFESSIONAL AND TRADE SOCIETIES.

SANITARY ASSOCIATION OF SCOTLAND.—The annual business meeting of the Sanitary Association of Scotland was held on Thursday night in last week in the Museum Hall, Paisley. Dr. Campbell Munro presided. The annual report noted that sixty-one new members had been admitted during the year, giving the total to 250. The number of officers and members present. This year there was a greater attendance of the local authorities of the country than ever before at any one Congress, no fewer than 95 being represented. The report was adopted, as was also the financial statement, showing a balance at credit of £558 19s. 3d. Officers present were next elected: Mr. C. Bine-Renshaw, M.P., and ex-Provost Mackenzie, Paisley, being elected joint honorary presidents; Dr. Farquharson, M.P., Aberdeen, president; Professor Glaister, Glasgow, and Mr. Kenneth Cameron, Aberdeen, vice-presidents; and Mr. George Middleton, writer, Glasgow, and treasurer. The Council and examiners of Parliamentary Bills committee were also appointed. The secretary reported that on the register of persons certified by the association 332 names were now enrolled. It was intimated that Kirkcaldy would probably be the place of next year's Congress. The Glasgow meeting was on Friday, when papers were read by Dr. J. T. Wilson, Medical Officer of Health for Lanarkshire; Mr. Peter Pye, sanitary inspector, Glasgow; Dr. Munro and Councillor Mallinson, Edinburgh.

CHIPS.

Mr. G. F. Watts, R.A., is busily engaged on two great pictures—one, called "Conquest," representing a magnificent horse that steps forward under a man's control; the other called the "Seat of Death."

The Local Government Board have sanctioned a loan of £35,000 to the Cheltenham and Tewkesbury Town Council, for the purpose of erecting a Town-hall on the Winter Garden site in Imperial-square.

The construction of a military railway to cross the great lines at Chatham has been commenced at Chatham, in connection with the entrenchment and field works which the Government have acquired an extensive tract of wooded and arable land on the outskirts of the garrison. The railway will connect the School of Military Engineering with Fort Danard and the new field works.

New premises have just been built for Messrs. Ellington and Co. in Lord-street, Liverpool. The work of reconstructing and adapting the building was intrusted to Messrs. Waring and Gillow, Limited, of Bold-street, Liverpool. The double-curved front, 30 ft. in height, which was specially designed, is Spanish Renaissance in style. The lettering is treated in gold mosaic. The big clock is placed in a conspicuous position over the front.

The drainage system of Cardiff Castle has been recently undergoing extensive improvements and renewals, and in the course of the excavations inside the Roman camp the workmen came across, five or six feet below the ground level, a few slight traces, in addition to those already discovered, of Roman occupation. These further vestiges of the ancient city of Eborac, as the Romans called it, are of great interest. They consist of some pieces of pottery and a metalled rod. Besides these, there have been found other remains of more recent times, among them a skull. The nature of the masonry is a mixture of stone and brick, and the foundations of the foundation of boulders, and in this respect it is similar to other Roman roads.

A square tower is at present being built on the south frontage of the Nicolson Institute, Stormoway. It shows a large moulded entrance doorway, and forms a vestule into the building, also triple and double-moulded lancet openings on the four sides of the tower, the whole surmounted by a large public clock, which is placed 60 ft. from the ground level.

In connection with the Wolverhampton 1902 Exhibition, the machinery hall will be a building distinctly original in treatment. The hall will be oblong in shape, having a Belfast roof in three spans. Over the main entrance will be three large circular openings, fitted in with radiating bars, which at intervals will be fitted at the terminals with a coloured electric light. The flooring will be of wood, but concrete foundations will be provided for the various exhibits. The hall will be a lofty building, 550 ft. long and 130 ft. wide.

The foundation-stones of a Salvation Army Citadel, at Consett, were laid on Saturday afternoon. The scheme embraces two halls, one for adults, accommodating 500; and the other for children, seating 200. The buildings, when completed, will have cost £1,730.

COMPETITIONS.

"OWEN JONES" PRIZE.—This competition was instituted, in 1878, by the Council of the Society of Arts, as trustees of the sum of £400, presented to them by the Owen Jones Memorial Committee, being the balance of subscriptions to that fund, upon condition of their expending the interest thereof in prizes to the students of the School of Art, who, in annual competition, produce the best designs for Household Furniture, Carpets, Wall-papers and Hangings, Damask, Chintzes, &c., regulated by the principles laid down by Owen Jones. The prizes are awarded on the results of the competition of the students of the School of Education, South Kensington. Six prizes were offered for competition in the present year, each prize consisting of a bound copy of Owen Jones's "Principles of Design," and a Bronze Medal. The following were the successful candidates:—Frederick Hoare, School of Art, Battersea, design for a Printed Muslin; George W. Barber, School of Art, Maclefield, design for Decorative Panels in Wall Tiles; Robert Gilchrist, Dalmarock Art Class, Glasgow, design for a Rug; Jessie Kilpin, School of Art, Leeds, design for a Stained Oak Fire Screen; George Mason, School of Art, Bradford, design for a Printed Silk; Robert C. Greenham, School of Art, Manchester, design for Woven Hangings. The next award will be made in 1902, when six prizes will be offered for competition.

HAWICK.—The first paragraph in our last issue (p. 315, third column) under the head of Competitions, describing competitive plans for a Carnegie public library, should have been headed "Hawick," and not Mansfield. The Mansfield competition, and similar library was settled a year or two since. Mr. Burnet's award as assessor in the Hawick competition has not yet been announced.

ST. ALBANS.—The local competition at St. Albans for the new infants' school at Garden Fields has resulted in the work being given to Messrs. Smece and Mena, the design by Mr. S. Dodd-mende Edmunds, of St. Albans and London, receiving the only premium awarded.

The foundation-stone of new Roman Catholic schools has been laid at Pontefract. Mr. A. Hartley, J.P., is the architect, and Messrs. Walker and Ward are the builders.

To commemorate the centenary of Cardinal Newman's birth, an effort is to be made to build a permanent church, the Gregory at Edghaston. Mr. E. Doran Webb, F.S.A., has prepared plans for a church which it is estimated will cost at least £23,000. Mr. Webb has adopted the Byzantine style affected by the Cardinal, and the plans provided for the cloister and facade now in existence, and designed by Mr. Clutton, to be retained; in fact, they furnish the keynote of the new design. The list of subscriptions so far received is headed by one of £1,000 from the Duke of Norfolk.

At the recent Licensing Sessions at Barrow application was made for a provisional license for the Birney Baths Hotel, to be erected on the west side of Walney Island. A license was granted for this hotel two years ago, and was renewed last year on the understanding that the Government at once provide with the work of erection. Nothing had been done, and the applicant now submitted amended plans for a first-class commercial hotel, with ninety-three bedrooms, and a bath, for 150 visitors. The new hotel would cost from £40,000 to £50,000. Mr. Connel, architect, Leeds, explained the plans. The license was granted, subject to substantial progress being made with the buildings during the next twelve months.

The joint water board of Conway and Colwyn Bay held a special meeting last week to consider the four alternative schemes prepared by the engineer (Mr. Farrington) for giving an increased supply to Colwyn Bay and the higher levels. The objection was proposed and seconded of No. 1 scheme, which provides for a line pipe to be laid from Saru Mynach along the Denbighshire side through Glas Conway to Colwyn Bay, the estimated cost being £22,000. To this an amendment was moved, to the effect that the scheme of No. 2, which would engage an expert to consult with their engineer as to the best method of meeting the requirements of the district, and to advise as to the relative financial conditions of the scheme, and that two representatives of each authority be appointed to lay evidence before him. On being put to the meeting, seven members voted for the amendment and seven for the motion, and the chairman declared the vote for the latter. It was then decided, by seven votes to six, that an expert be engaged to consult with the engineer.

Building Intelligence.

BATHS. The nave of a Roman Catholic minister at Beccles was formally blessed by the Abbot of Downside on Tuesday in last week. A local benefactor, Mr. Fred Smith, of Bungay, came forward and supplied nearly the whole cost of building the nave which promises to be a remarkable Roman church. The length of the nave is 90ft., and the extreme width of the church is 40ft. The model according to which the building is erected is the priory church of Blythe, in Yorkshire. It is a simple and massive structure, with a wide open triforium; and the exterior of the west end is marked by a deeply-recessed porch and angular turret. The architect was Mr. F. Hanham, of Beccles, and the decorator of the interior was Mr. Bodley.

BATHIST.—The board of guardians will soon be in possession of their new board-room. The architect for the work is Mr. W. E. Skinner, and the contractors are Messrs. Stephens and Bastow, of Bristol. About one-third of the old buildings at St. Peter's Hospital have to be demolished to make room for the new premises, the basement of which will contain, on a level with the main entrance, passage, offices for the clerk to the guardians, vaccination and settlement officers, &c. The board-room is on the first floor, on a level with the historic and still now used for that purpose. It is more than double the size of the old board-room, lofty, and lighting and ventilation have received special attention. The style is Jacobean. The sides are of panelled oak, rising to the height of the ceiling. The new buildings also include ladies' and gentlemen's cloakrooms, a retiring room for the chairman, and apartments for the caretaker. The cost of the work, exclusive of furniture, is about £2,200. The Peter-street frontage of the old building has not been interfered with, and the old board-room, with its oak paneling, and its grand ceiling and fireplace, is to be preserved as one of the sights of Bristol.—St. Paul's Church, Portland-square, which was opened for worship in September, 1794, is now undergoing renovation. About fifty years ago the pews were rearranged, but otherwise the church has remained unaltered. For some considerable time, however, the condition of the flooring and seating has been a matter for grave consideration, and the church is now in the hands of the builders, who are removing the side galleries, putting in a new west-end gallery, and renovating the interior. One of the principal alterations is the substitution of modern pews for the old-fashioned ones which have until the present time been in use. This church is probably the only one in Bristol where the worshippers have still used the old high-backed pews with sliding doors. New heating apparatus is also being laid down, an entirely new system being introduced, and electricity will be employed for lighting purposes in place of gas. The vicar's ward (Mr. George Wilkins, of the firm of Messrs. R. Wilkins and Son, builders, Bristol), who, being approached in the matter, accepted the contract on generous terms, has been proceeding under the direction of Mr. George H. Outley, F.R.I.B.A., of Bristol, and is estimated to cost about £1,400.

CHURCH. The opening of the new public baths took place last week. The principal features of the new baths are the two plunge-baths. The large one is 20ft. long, 10ft. wide, and the second-class bath, which is 7 1/2 ft. long and 5 1/2 ft. wide, with a depth of water varying from 3ft. 6in. at one end to 7ft. at the other, and surrounded by dressing compartments and a gallery. When it is not in use for swimming the fittings can be removed, and the bath can be used as a gymnasium. The first-class bath is a smaller rather smaller, being 60ft. by 30ft. There are seven second-class slippers and one vapour, three men's first-class slippers and one vapour, and four women's slipper-baths with waiting-rooms and separate entrances for the sexes. Besides the actual bathing room there is a laundry, ironing-room, sitting shop, with up-to-date machinery, and a large boiler-house with passages around the whole of the baths, below ground. There are also offices and a house for the superintendent, containing kitchen, scullery, sitting-room, and three bedrooms, and lighted, like the buildings all through, with electricity. The water used in the baths will be taken from the city mains, and heated to what temperature may be required. The baths themselves will be

heated throughout with steam. The cost of the baths, which are built in stone and Russian brick, has exceeded the estimated £11,000. The architects for the baths have been Messrs. Douglas and Minshall, and the contractor was Mr. W. W. Freeman, all of Chester.

CHREVENING, KENT.—The reopening of the parish church after its restoration took place on Wednesday in last week. The works have been completed by the Messrs. Tomlin and Coxon, of North Walsham, Norfolk. It was found that the floor and seats were full of dry rot, and these were removed. The floor was then lowered about 6in., and, instead of the old plank, a block flooring was put down. An additional step was required for the altar, which was raised by 2ft. The pulpit, organ, and reading-desks were supplied with new bases, and the vestry has been separated from the main building by an oak screen. An old ash screen, filled in at the top with glass, which at one time stood inside the west door, has been removed, and the font placed at the top of the main aisle instead of in the centre. A new staircase has been constructed in the tower, and the old west doors have been done away with and replaced with one of oak. The interior of the walls has been cleaned. Mr. W. P. Crichton, the architect, who the work has been carried out under the personal supervision of Mr. G. Howard. The restoration has necessitated the expenditure of £1,350.

FINSBURY PARK.—The Finsbury Park Synagogue, which was consecrated by the Chief Rabbi on Sept. 8, is situated in Princess-road, Finsbury Park. The building provides accommodation on the ground floor for 300 gentlemen, and in the galleries for 14 ladies—in all 314. The building is provided with two stone staircases, a complete installation of heating on the American plan, and ample cloakroom accommodation for both ladies and gentlemen. The exterior is executed in red brickwork, relieved with stone dressings. The principal entrances to the ground-floor are on the main facade in Princess-road, the secondary entrances and the entrances to the galleries being at the rear of the site. The building has been constructed by Messrs. Whitehead and Co., Ltd., from the designs of Mr. Delissa Joseph, F.R.I.B.A.

GLASGOW.—The new engineering laboratories at Glasgow University, built at a cost of £25,000, and opened last week, were designed by Mr. J. Oldrid Scott, of London, in co-operation with Mr. John J. Burnet, of Glasgow. They have a frontage of about 210ft., 75ft. of which is occupied by a block four stories high: the main entrance is on the ground floor, and the remainder of the length, is a one-story building with roof-light. In the basement of the four-storied building there is an hydraulic laboratory 70ft. by 32ft., a storage-battery room, and a heating and ventilating chamber. The first floor is occupied by an electrical laboratory, a museum, the large lecture-room, and a smaller classroom, while above these are another small classroom, a laboratory for practical mechanics, a drawing classroom 78ft. by 34ft., which will accommodate about 100 students at the same time, and a library and reading-room for the use of the students. The main engineering laboratory is 135ft. long and 54ft. wide. It has a partial basement 58ft. by 27ft., utilised for the accommodation of boilers and furnaces. The roof of the main laboratory is carried in seven spans of 18ft. The main lecture-room, glazed on the north side, has two hand travelling cranes, designed to carry 5 tons, command the whole area of the room. There is already installed here a 100-ton horizontal testing-machine with variable weight accumulator by Messrs. Buckton and Co., Leeds.

HAMPSHIRE.—The Hampted Synagogue, which was consecrated by the Chief Rabbi, on September 1, on September 1, has been built nine years ago from Mr. Delissa Joseph's plans. The enlargement has been effected by removing the east wall of the Synagogue, and extending the choir eastwards to the limit of the site. The choir, which was originally at the rear of the Ark, is now in the front of the Ark. The original number of sittings in the buildings was 366 on the ground floor, and 299 in the gallery. The additional seats provided by the enlargement are 81 on the ground floor and 100 in the gallery, giving a total seating capacity of 547 souls. At the rear of the building are two staircases in Denington Park-road in excess of the needs of the London Building Ark, the opportunity has been taken, in effecting

the extension of the building, to provide two supplementary driveways at the east end, one of which leads directly into the West End Lane. The design of the original structure has been carefully maintained in the extension, and the opportunity has been taken of relocating the entire building in pure white. The contract has been carried out by Mr. Henry Lovatt, from the designs and under the superintendence of Mr. Delissa Joseph, F.R.I.B.A.

LLANUDNO.—The Bishop of St. Asaph consecrated on the 4th inst. St. Paul's Church, better known as the Duke of Clarence Memorial Church, at Craigydd, Llanudno. The edifice provides sittings for 350 worshippers, and is in style Early English. It is 44ft. long of nave, 94ft. long by 28ft. wide, and 44ft. in height from floor to roof, with north and south aisles, and entrances towards the west and south; a chancel, 37ft. long and 25ft. high, with an aisle or chapel on one side, and vestries and organ-chamber on the other. The tower and spire will stand at the south-west angle of the choir, and will be a very conspicuous object, both from the esplanade and from Mostyn-street. The church is built of a local limestone, with dressings of Bromsgrove stone, the interior walls being faced with Bath-stone ashlar. A feature of the interior is the use of fossil marble from Frosterley, Northumberland, for all the main columns. This is a deep grey on black marble, with larger fossils of a lighter shade scattered through it. The ventilation is by a system of inlets in the sills of the side windows and a large fliche on the roof, in which an extracting ventilator has been placed. The church, situated in the eastern portion of the town, stands in the parish of Llanrhos, and consequently in the diocese of St. Asaph—the main portion of the town, the parish of Llanudno proper, being in the adjacent diocese of Bangor. It has been erected by the Duke of Clarence, and was built in sections, the nave having been opened in 1895. The two side aisles were added in 1899. The chancel, which has just been completed, is the gift of Lady Augusta Mostyn. One of the side aisles is the gift of Mr. John Walker, of Liverpool, and the other special donations are the alabaster pulpit, the brass lectern, which cost £100, the granite font, with oak cover, together with the communion plate, valued at £150, the heating apparatus, which cost £300, and the alms dish. A further sum of £1,350 has been expended on the church house.

METROPOLITAN ASYLUMS BOARD.—At the last meeting of the Board, a letter was read from the Local Government Board stating that, with much hesitation, owing to the large cost involved, but relying on no moneys being expended on any unnecessary work, and on the estimated expenditure (£284,312) not being exceeded, they were prepared to approve the plans of the Southern Hospital, and asking for copies of the plans. Mr. E. White, replying to questions, said that the reason the buildings were so costly was that the Local Government Board themselves had insisted that the unit of accommodation in the cottages were to form the hospital should be smaller than it had hitherto been. The accommodation would be for twelve persons, and the Local Government Board managers had asked that it should be increased to fifteen, and that had necessitated the construction of a large number of cottages. The original estimated cost had been reduced as much as possible, having regard to efficiency. The managers of the hospital, Messrs. Messrs. Parsons and Sons, 118, Church-road, Hove, for the erection, at a cost of £172,238, of four seaside homes for children at Rustington, near Littlehampton, in accordance with the plans and specification prepared by Mr. Rowland Plimbe, architect, and the seal of the Board was affixed to the contract.

MORECAMBE.—On Saturday last seven memorial-tombs were laid for the new Baptist chapel. The architect is Mr. Albert Gorton, M.S.A., 24, The Crescent, Morecambe. The chapel almost fills the whole of the land bounded by Victoria, Chapel, and Edward-streets. The ground floor of the chapel is arranged in the chapel street side, and has two passages. Behind the vestry is a passage connecting the vestries and classrooms. On the Edward-street side is the minister's vestry with lavatory, and also lavatories for the schoolroom. It is intended to convert the present chapel into a school. In the chapel street side is a class room, which can be divided into two by means of folding partitions. The gallery floor is arranged with passages and benches. Behind and above

the rostrum are a singers' gallery and organ chamber, with staircase from the passage below. In the basement is a kitchen, lavatories, store-rooms, and a door leading to the ground floor. The accommodation for 380 seats, allowing 18 in. for each person, the gallery 34 seats, and the singers' gallery 20 seats, making a total of 748 seats. The outer walls will be faced with Yorkshire pierpoints and ashlar dressings. The roof will be covered with red and blue Welsh slates. The windows and all internal doors, porches, and partitions will be glazed with tinted lead lights and have hopper ventilators. The whole of the carpenter's and joiner's work will be pitchpine timber, and the framed work will have yellow pine panels, and will be varnished. The floors of the vestibule and passage will be laid with mosaic tiles of red and white concrete. The roof is to be in pitchpine, with hammer-beam laminated rafters resting on moulded stone corbels. The ceiling will be open the whole length of the chapel, and will have plaster mouldings. Ventilation has been provided for by hoppers in the windows, by fanlight windows in the doors, and by exhaust ventilators fixed in roof and ceilings.

The work has been let to the following: Mr. H. Ramsbottom, mason, &c., Accrington; Mr. Jas. Greenwood, carpenter and joiner, Cross Hills, Keighley; Messrs. Hill and Nelson, slaters and plasterers, Morecambe; Messrs. Cross and Webb, painters and glaziers, Accrington; Geo. Lee, painter and varnisher, Morecambe. The special parts of the building have been let to the following:—Construction, steel and ironwork, Messrs. Foster Bros., Limited, Preston; iron railings, gates, and columns, Sloan and Davidson, Leicester; mosaic flooring, Gurney and Walker, London; folding doors, Mr. John Stone, Ulverston; leaded lights, Messrs. Pilkington Bros., Limited, St. Helens; heating apparatus, Messrs. Mercer Bros., Blackburn; ventilation arrangement, Messrs. A. Gill and Co., Lancaster; carving, Mr. Henry Cusson, Lancaster; electric lighting, Messrs. Battenhill and Smith, Middlesbrough; clocks and other furniture, Messrs. Parker, Winder, and Achurch, Birmingham.

PETERBOROUGH.—The works now being carried out by Messrs. Thompson and Son, of this city, for the completion of the restoration of the west front, comprising the rebuilding stone by stone of the great central arch and gable, the restoration of the pinnacles and battlements, the rebuilding of the spire, and the pointing and repainting of the Bell Tower: the total contract for these works being a little under £1,500. The northern and southern gables of this "finest portico in Europe" were restored during the years 1896, 1897, 1898, 1899, and 1900, the other works of restoration of the cathedral having been completed subsequently to the last year. Its reconstruction is now—together with kindred work—being undertaken as a memorial to the late Dean Ingram. Unlike the sister gables north and south, the central gable with its huge finial cross has not had to undergo removal. The defects are more or less of superficial character, and—removals of stonework which the exposure of centuries has crumbled, and making the supporting wall and vaulting stable and complete. The part which has crumbled the most is the outer label of the great arch. The huge wheel window will require much overhauling, and some of the masonry, which are of Alençon work, will have to be replaced with new. The floriated finial cross, which measures fully 8 ft. in its socket and 6 ft. across the arms, has had to be dovetailed and made secure. But on the whole it had suffered less from exposure than the smaller crosses on the adjoining gables, which measure 6 ft. long and 4 ft. across. A portion of the uppermost fortification was missing, and this has been replaced in stone from the original quarry—Barnack—Messrs. Thompson having bought most of the Barnack stone from the old Low Farm buildings, now the site of the Peterborough

City Sanatorium. In that way most of the repairs to the cathedral have been enabled to be made in Barnack rag. In the same way sufficient Alençon marble has been retained from the little quarry at Orton, which was opened by the firm in the early nineties. The work of restoration, which is being completed under the supervision of Mr. Frank L. Pearson, is expected to be finished in another twelve months' time.

SHOREDITCH TOWN HALL.—On Wednesday the Mayoress of Shoreditch laid the foundation-stone of the Shoreditch Town-Hall extension. The new new structure will be about £30,000. The area is 4,000 sq. ft., and it will have a capacity of 80,000 ft. Mr. W. G. Hunt, of Bedford-gardens, Kensington, is the architect. The extension is severely Classical in style, to correspond with the present town-hall, and a tower, erected at the juncture of the old and new structures, will give unity to the whole.

ST. HELENS, LANC.—The scheme for providing the much-needed open space in front of the St. Helen's Town Hall is now in course of completion. Already several of the buildings have been razed, and it is expected that towards the end of April next the new premises, with a frontage to the town-hall, will be ready for occupation. The open space, which will be on the east side by the new Renaissance buildings of the Gamble Institute, including the Central Library and Technical Schools, will have an area of about 4,000 sq. yds. This institute was built in 1894-6 from designs by Messrs. Briggs and Wolstenholme, of Blackburn and Liverpool, and was illustrated in our issue of Aug. 21, 1900. Mr. W. G. Hunt, of Atholham, J.P., and Sir David Gamble, Bart., C.B., have given up valuable sites to complete the square. The work is being carried out by Mr. Joseph Ellison, builder and contractor, and the architects, Messrs. Briggs and Wolstenholme, have arranged for the new buildings, fronting the town-hall, to be built on the site of their Gamble Institute. The new buildings will be of Ruabon brick, with terracotta dressings.

CHIPS.

The delay in using the tramways through High-street, Stourbridge, has at last come to an end, and the Electric Tramway Company are now running their cars to the new terminus in Hagley-road, Stourbridge, and the new tramway from the High-street extension *via* Foster-street to Lyce, and *via* Enville-street to Wollaton will shortly be begun.

The members of the corporation of Congleton met at the town-hall last week to appoint a manager of the corporation gasworks, at a salary of £130 per annum. Fifty-seven applicants had been received, and the list had been reduced to three by the gas committee. Mr. J. Smith, assistant manager, Padstow U.D.C. Gasworks, was appointed.

At East Putney, S.E., a Roman Catholic church is in course of erection from plans by Mr. Goldie. At present the nave only is in use, and accommodates about 400. Aisles are in progress, one of which will shortly be opened. In due course the sanctuary, tower, and other elements of the design will be finished, and the mission will possess an edifice worthy of its purpose.

In memory of Old Carthusians who have fallen in the South African war, a set of open arched cloisters is being erected on the south side of the school-chapel at Charterhouse, Godalming, together with a new transept and a new porch, and the rebuilding of the turret. The memorial-stone will be laid on Saturday, the 28th of this month.

The committee of the Rawal Pindi (Punjab) Queen-Empress Memorial Fund has commissioned the Statuary Company of London to erect a monument at Rawal Pindi in memory of the late Prince of Wales. The monument will be represented in a sitting posture, and the sides of the stone pedestal will be adorned with sculptured representations of the Coronation scene and other incidents in the late Queen's life, and also with a commemorative of the Prince of Wales's visit to India.

The hall attached to the County Clubhouse at St. Alban's has been enlarged and rebuilt to serve as a theatre, from plans by Mr. F. W. Kimmer Tarte, of that city. The contractors are Messrs. Whitley and Jones.

At Monday's meeting of the Wolverhampton Town Council, a letter was read from the Local Government Board sanctioning the borrowing of £13,850 for the erection of a covered wholesale market, and £3,000 for the provision of cold-air and ice-making apparatus. The meeting decided to spend £1,300 in widening New Hampton-road West, so as to permit the construction of a double line of tramway track.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to the Editor of the *Times* or *Illustrated*. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

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RECEIVED.—D. L. T. and Co.—A. S. L.—E. H. and Son.—B. L. M.—F. G. Co.—M. A. O. B.

REV. FOSTER.—Lafayette, 94, High Holborn, will recommend suitable books. The necessary instruments can be bought at W. Watson and Son, High Holborn. 2. We know of no lending library of the kind. 3. We cannot undertake to quote all prices, or to enter here fully into the uses of foreign and colonial timbers. 4. We cannot undertake to enter here fully into the uses of the paper, and keep the articles.

ENGINEER.—The "Projoim" has not, as yet, got beyond the stage of suggestion, so far as we know. At any rate, the project is not yet ready to be adopted in the ordinary means of making their existence known.

Correspondence.

THE WESTMINSTER PAVING CONTRACT.

To the Editor of the BUILDING NEWS.

SIR,—The adoption of the so-called Californian red gum in the principal thoroughfares of Westminster has been ventilated by several correspondents in the *Times*, *Morning Post*, *Daily Telegraph*, *Daily Chronicle*, and other journals; and it is as well that the subject should be placed before the public in a concise manner, and that a clear and unprejudiced opinion may be easily formed upon the merits of the question.

The letters of the Hon. H. B. Lafroy (the Agent-General for Western Australia), the Hon. Henry Copeland (Agent-General for New South Wales), and others respecting the above matter deal with the question, and on behalf of the Ratepayers' Committee of the City of Westminster

propose to lay before your readers the facts which comprise the ratepayers' case.

It will be remembered that in July last public tenders were invited by the Westminster City Council for various street-paving operations, and amongst the other conditions of the specification, clause 14 provided as follows:

"The wood blocks to be cut to the exact size of 9in. long by 2in. deep, and 3in. wide. Each block to be cut perfectly true in size and shape, the doals being 'dimensioned,' if necessary, before sawing, in order to insure this."

The following firms duly tendered: The Acme Wood Flooring Company, Ltd., John Mowlem and Company, William Griffiths and Company, Ltd., The Improved Wood Pavement Company, Ltd., E. Nuttall, and Edward Alcott.

It appears that the Works Committee, which referred the various tenders, referred them for consideration to a sub-committee. This sub-committee, finding that it had little experience of the American red-gum blocks, recommended that a portion of the road only should be paved with them, in order that they might be put to an effective test. To the surprise of the sub-committee, when this proposal came before the Works Committee, some of the members championed the American paving with a great deal of feeling, and urged that a large contract be entered into with the firm. Mr. Emden, chairman of the committee, and other members strongly opposed this course, and a somewhat heated discussion followed, which lasted upwards of three hours, the supporters of the American system carrying their point in the end.

A meeting of the city councillors was held on August 1st, when Colonel Probyn, the chairman, in the absence of the Duke of Norfolk, presided, and on the agenda, the question relating to street-paving being reached, which, curiously enough, did not happen till the 14th of the meeting, and after 6 p.m., when, by the standing orders of the council, no opposed business is permitted to be taken, the works committee stated that they had examined the tenders received in response to public advertisements, and recommended that the tender of Edward Alcott for American red gum, and the tender of the Improved Wood Pavement Company, Ltd., for the Swedish deal be accepted, although the Acme Wood Flooring Company's tender for 9in. blocks, which was the size called for by the specification, was the lowest, as the Improved Wood Pavement Company's tender was for 3in. blocks. The quantity of timber required for this part of the contract, which is for Swedish wood, amounts to over 800 standards, and the difference in the market value of the two sorts of timber is 4s. 6d. per standard, so that the Improved Wood Paving Company had the advantage of nearly £3,000. Therefore, if the extra £3,000 is added to their estimate, the Improved Wood Paving Company's tender becomes nearly the highest of the whole, instead of the lowest, as represented by the Works Committee.

The Westminster City Council stipulate that any firm shall be disqualified and their tender deemed out of order if it is not in accordance with the specification, and the following extract from page 21 of the Agenda, which was read on August 1st shows that John Mowlem and Company and William Griffiths and Company, Ltd., were so disqualified:

"The tender of Messrs. William Griffiths and Company, Ltd., and Messrs. John Mowlem and Company are considered to be out of order, inasmuch as they do not provide for maintenance beyond the three years' free maintenance. Apart from this, however, the said tenders are not the lowest for the kind of material it is suggested should be used, and it will be observed that, without exception, the lowest tender of its class is taken."

The evident unfairness of what took place is shown in the sixth paragraph of the same page of the Agenda, which is as follows:

"The Improved Wood Pavement Company, Ltd., propose to use 3in. blocks instead of 9in. The Company, in their tender, do not guarantee that the cross-sill to be used for the yellow deal blocks shall contain the amount of tar acids specified, and we think it well that acceptance of the Company's tender be made subject to the withdrawal of the last-mentioned conditions."

Now, the Improved Wood Paving Company, according to the disqualifying rule, should have been refused on tender for not tendering for 9in. blocks, and the tender for Swedish deals should have been given to the lowest tenderer—viz., the Acme Wood Flooring Company, Ltd., as they and

E. Nuttall were the only firms entitled to be considered, having complied with the terms and conditions of the specification. It is here that the good faith of the council is at stake, and the question arises as to how the firm that violated the rule can be not only not disqualified, but their tender actually recommended, although entirely out of order. The Improved Wood Pavement Company would hardly of their own initiative have tendered for what was not asked or required in the specification.

When the transaction amounts simply to this: Several eminent firms are asked to tender; one of them privately suggests that some other particular article should be adopted, and the order is given to them. This is manifestly unfair, inasmuch as if 3in. blocks were to be used instead of 9in., as originally intended, fresh tenders would have been asked for from all the competing firms. In common honesty, and for the sake of the good name of the City of Westminster, this contract for Swedish wood should be at once rescinded and given to the firm whose tender was the lowest.

The adoption of American red gum by the Westminster Council has caused much surprise and astonishment amongst the members present, one of whom desired the opinion of the surveyor as to red gum and his experience of it; but strangely enough the chairman replied that it would be inadvisable for the surveyor to give his opinion at a public meeting. Consequently, the information could not be obtained. The vice-chairman of the Works Committee, Captain Jessel, M.P., on being questioned on the subject, frankly stated that he knew nothing about the red gum wood, except that it was well advertised, and had a good reputation abroad. Even this statement appeared to have the slightest foundation, in fact, as the timber as a paving wood is practically unknown, and is scarcely used, if at all, in the country America from which it comes. He also said that there had not been sufficient time to prove its durability. The points had been discussed for some hours by the Works Committee, and on this account he thought the matter should close. This appears to have been all that took place in connection with this important subject. Certainly it did not receive more than ten minutes of the councillors' attention, and they were hurried to the holidays, so that the surveyor had done his duty in handing over upwards of £100,000 of the ratepayers' money in this irregular and slipshod manner.

It is only fair, however, to the Works Committee to state that they had originally intended to reopen the question at the meeting of the City Council on the 14th of the month, but that the Council had been sitting nearly three hours, and several members had departed, including the chairman of the Committee, who was called away by a professional appointment. But for that Mr. Emden would have opposed his own Committee. As it was, coming at the end of a long sitting, the tenders were all passed within a quarter of an hour.

The Governments of Western Australia and New South Wales have expended a very large amount of money in introducing and demonstrating the use of the American cauliflowers, and they do not doubt whatever the incalculable trade in this business contributed to the generous feeling displayed by the Colonials in our recent South African trouble. The matter still more comes home to the ordinary citizen when one considers that in the English companies which have been the purveyors for introducing this wood some millions of English and Australian capital has been embarked. For these reasons everyone should be more or less interested in seeing that Australian wood should have in every respect the preference, especially when it has been demonstrated that it is practically worth it.

A vast number of the principal municipalities in the United Kingdom have for some years adopted Australian hardwoods with the most satisfactory results. Indeed, no complaints were made as to its durability, or its evenness when cut, or its strength, but unfortunately the surveyor for the St. James's district of Westminster stated that it was wearing in holes in several parts of his parish. Chiefly in consequence of his action, the Australian wood had been discarded in Westminster; but an examination of the road conditions, when the matter was taken up, disclosed the astonishing fact that the unevenness and holes in the roadways entirely arose from one cause alone—viz., that the concrete foundation was bad in the extreme, and had given way in every place where the holes had

appeared. No wood, however good, could possibly remain even and give satisfaction when laid on such a rotten foundation.

The red gum has only been laid down in a few important places within the last year or two, and this is principally due to the surveyor of the St. James's district before referred to, who, without public competition, secured its adoption in Pall Mall, Piccadilly, &c. It may, if of good quality, prove a serviceable pavement; but it is quite certain that the class of block—supple and rotten—used in the St. James's district, Piccadilly, &c., is not the rough wear-and-tear to which they are subjected, and, further, the blocks are not to the specification called for—viz., 9in. by 5in. by 3in., as many of the blocks laid varied in size from 5in. to 10in. long, by 4in. to 2in. deep, and 2in. to 3 1/2 in. wide. What sort of pavement can possibly be made with such an assortment of sizes as this, even if the wood was of the best possible quality? The chairman and members of the Works Committee should surely give some attention to these matters, and supervise in some manner their action, so that they should be so wanting in their duty.

—WE ARE, &c.,
THE WESTMINSTER RATEPAYERS' COMMITTEE.
A. Westleigh Ellerton, B.A., J. Macdonnell, Honorary Secretaries.

P. S.—This committee has been formed for the purpose of investigating the circumstances, instituting inquiries, and taking any necessary action which may be required in connection with the contracts for street paving by the Westminster City Council.

S. Regent-st., Waterloo-place, S.W., Sept. 11.

CHIPS.

Messrs. Haller and Marshall have obtained the first award for a scheme of waterworks (pumping, storage, and distribution) for Ferringion (Guernsey, near Bristol).

The district committee appointed to carry out the erection of a new Orange hall in Lurgan have adopted the plan submitted by Mr. J. E. Lee. The cost of the undertaking is approximated at £2,000.

At a recent meeting of the General Purposes Committee of the town council of Warrington, Mr. J. J. Webster submitted a sketch plan of the proposed alteration of Warrington Bridge by means of cantilevers, which was approved of. He estimated the cost of constructing the proposed cantilevers at £3,125.

Robert Rowell was summoned at West Hartlepool Police-court on Monday, on a charge of making an alteration in a building without the approval of the corporation. The town clerk said the alteration was in itself very small, but affected the whole character of the premises and the sanitary accommodation. Defendant had put up a partition in his shop, for which he had got permission, while occupying the whole shop himself, but had since altered up the opening and let part of the premises to another tenant without any sanction. Evidence bearing out this statement having been given by the corporation building inspector, the Bench imposed a fine of 3s. and costs.

The application of electrical traction to the tramways and light railways in Dudley and Kinver district was inaugurated on Saturday, when, in the presence of a large number of invited guests, a large party, including representatives of local authorities interested, travelled over some of the lines between Dudley and Kinver.

The public works committee of the town council of Wolverhampton have agreed to purchase a block of property at the corner of North-street and Wadham's-hill, and also the garden fronting the old Giffard House, the residence of the Catholic priest, for £2,850. The object is to widen the thoroughfare at the corner of Wadham's-hill.

A new chapel which has just been erected by the Primrose Hill congregation at the corner of Camp-street and Great Clowes-street, Brompton, was opened for worship on Sunday. The building takes the place of the old chapel in Blackfriars-street (which has been sold), and affords accommodation for 140 people. It is in the Renaissance style, designed by Messrs. Sankey and Cubbon, of Manchester, and has cost about £7,400.

A meeting of the parishioners took place in the vestry at Whitechurch, on Friday, to consider the question of carrying out alterations in the parish church. The two sides of the church have been restored with stone according to contract, and it is now suggested to treat the west end similarly, and also to carry out restorations and improvements in the apse, chancel, vestry, &c. The total cost is expected to be about £2,000, and of this about one-half has been raised.

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ILLUSTRATIONS.

GENDS MARKET HALL.—L'ART NOUVEAU FURNITURE, FROM THE PARIS EXHIBITION.—BUNNELL GUILDHALL, WINSFORD.—MATSOLEUM TO THE LATE PROFESSOR BANISTER FLETCHER.—PROFESSIONAL CHAMBERS AT BIRMINGHAM.—OLD ENGLISH FURNITURE AND EIGHTEENTH CENTURY FURNITURE.—FURNITURE FROM MESSRS. CHRISTIE'S SALE ROOMS.

Our Illustrations.

LEEDS MARKET HALL.

We have already given one exterior and two interior views of the great Municipal Market which Messrs. Leeming and Leeming, the architects, are erecting at Leeds. Our previous illustrations, with some particulars, appeared in the BUILDING NEWS for April 26 and June 21 last. The present view gives a good idea of the extent of the exterior and one of the main fronts.

L'ART NOUVEAU FURNITURE FROM PARIS.

This remarkable furniture was exhibited at the Paris Exposition, and is now on view in the Victoria and Albert Museum at South Kensington. Our illustrations are from some excellent photographs taken by the Museum authorities, to whom we are indebted for their loan. The bed-stead shown in the centre of our plate is the work of Messrs. Péro Frères, and is described as Modern French. The iris flower inlays and water-flowers rise at the foot of the bed from a base in which water, conventionally treated, occurs in different woods. The Cabinet to the left of the sheet was designed and executed by M. Louis Majorelle, of Nancy. A great feature being made of the metal hinges and escutcheons to the lower doors. The central divisional bar is treated as the stem of a tree, with roots below and foliage above, carved with delicacy. The upper door is elaborated by a boat-like scene with birds, and done in the same work in coloured woods. The smart artist designed the graceful Armchair to the right of the bed. The Tea-table above the last piece is the work of M. Emile Gallé, each stage or shelf being inlaid in the most refined and skillful manner. A change in style is to be noted in the Hungarian Chair to the right, in the middle of the plate. It was designed by Mr. Edmund Farrow, who has produced a rich and fresh piece of furniture, in which the ornament of the seat and back make a decided feature. The Table, as may be readily noticed, was designed by the same hand; curving here also being an intrinsic part of the style. We hope to give other examples from the same rich collection, which for workmanship could hardly be surpassed, and for novelty deservedly attracts considerable attention.

BUNNELL GUILDHALL, WINSFORD.

This building is the gift of Sir John T. Branner, Baronet, M.P., to the town of Winsford in Cheshire, for the daily use of the various trade and friendly societies. The accommodation consists of entrance and staircase hall, secretary's office, four committee rooms, lavatories, &c., on the first floor, and four large committee rooms on the second floor, two of which, by means of a sliding partition, can be thrown into one for the purpose of general meetings, &c. The building, which is of red brick, with red terracotta dressings and green slate roof, is heated and ventilated through-

out, and completely furnished and lighted. The contractors were Messrs. J. Fowles and Sons, of Winsford, and Mr. A. E. Fowles, of Northwich, was the architect.

MATSOLEUM TO THE LATE PROFESSOR BANISTER FLETCHER, F.R.S.B.A.

The monument has been erected at Hampstead Cemetery over the family vault, and is situated where four roads meet. It consists of the bust in bronze of the late Professor, which was exhibited at the Royal Academy, on a stone pedestal of Green Lizard granite, and surmounted with a capital charged with the family arms and legend, the whole worked in a wreath of laurels. The podium rests upon three steps, typical of the three graces, Faith, Hope, and Charity, and is treated in a broad manner, and designed to receive future inscriptions. Four monoliths carved Ionic bases and capitals, the laurel being again used as a decorative ornament in these. The entablature and roof is richly moulded and carved, and is crowned with a sculptured vase, from which issues a flame, representing the flickering of a light. The ceiling over the bust is enriched with symbols of the beginning and end of all things, and the keys to the gates of heaven, and is in old Scripture form. At the base, as supporters, are seated two life-size figures of Faith and Fortitude. The whole of the work is executed in specially selected hard brown Portland stone, and the oak carvings and scrolls are carried out by Messrs. Flint Bros., of Bedford-road, Clapham, from the design and detail drawings of Messrs. Banister Fletcher and Sons, the architects.

PROFESSIONAL CHAMBERS, CORNWALL STREET, BIRMINGHAM.

The illustration of the above building which we publish this week is a reproduction from a water-colour drawing which appeared in this year's Academy Exhibition. The conditions of the plan have, fortunately, conspired to allow of a less monotonous treatment of this street front than might otherwise have been necessary. There are two entrances, one giving an access to the upper floors, and the other to the ground floor only. Between these two entrances is a little windowed recess for an attendant, who controls both of them, the recess being at the head of a staircase leading down into the basement where the caretaker's rooms are placed. It is the entrance on the left-hand side which gives access to the upper floors, the window next it being that of the attendant's recess. The bay above them contains the principal staircase, and while this bay is similar in size to the other one, which belongs to the rooms, it is the necessary variation in the fenestration of the two bays, together with the windowed recess, which breaks up the elevation without destroying the unity of the whole. The perspective will itself sufficiently speak of the other features of the front, which is constructed of thin (2in.) red sand stock bricks and "white" Hollington sandstone, the roof being covered with red tiles, and the street front of 31ft. 6in. and depth from front to back of 31ft., and the rooms in the back portion of the building have to be lighted to a large extent from the site itself, and so demand the two areas shown on the plan, which sufficiently indicates the disposition of the rooms generally. The basement is reached through a small landing down to an inclined and covered passage, affording a direct cycle approach from the street, and is given up to one or two offices and to storages and caretaker's rooms. The ground floor, with its separate entrance, is occupied by medical specialists. The first floor is used in part by the proprietor—a dentist—whose waiting-room is on the street front, and opens on to the first floor balcony, and whose operating-rooms are at the back, with excellent north light, while the rest of the building is given up to two physicians, one of whom has an operating-room and a small private hospital in connection with it. This operating-room is on the upper floor, with a perfect front and top-light, while a passenger lift gives communication with the lower floors. A minor staircase also connects the three upper floors. It should be mentioned that the adjoining building shown in the view is the Matsoleum erected by the architect, Mr. Richard Jones, Cornwall-street being one of the new streets in a central position, which are contributing so much to the improvement of Birmingham. The architects are Messrs. Wm. Henman and Thos. Cooper, and

the total cost of the building itself was just short of £5,000.

OLD ENGLISH FURNITURE.

These pieces of furniture come from the collection of Mr. W. Cole Pownall, of Southam, Norfolk, and consist of a heavily moulded and panelled Jacobean Cabinet, on which are standing a leather blackjack, 16th century, and 17th century leather bottle, an Elizabethan and Bellarmine jug dated 1629; also a Delft jug with pewter dated 1700. The Escritoire is in walnut of the 17th century. It stands on four legs, with fall-down drawers, containing a number of drawers and pigeon-holes. The front has an inlay of white wood, of geometrical form. This piece comes from King's Lynn, a town of much historical and architectural interest. The second Jacobean Cabinet is also heavily moulded, with a pedestal of an octagonal shape. It contains four drawers and two cupboards underneath. The Queen Anne Settee is of mahogany, covered with rose damask; whilst the Chair is also believed to be of the same period.

FURNITURE FROM MESSRS. CHRISTIE'S SALE ROOMS.

These, with many other pieces of furniture, came from the Renaissance Galleries in New Bond-street, and were recently sold at the above rooms. The Armchair is of oak, the door of which is divided into four panels, carved in high relief, with busts and other ornaments of the Holbein School, whilst the hinges and lock are of cast-iron. The walnut Armchair has a triangular seat and narrow rectangular back carved in low relief, with mask, strapwork, and shells. It is French Late 16th century. The oak Armchair dates back to 1650, and is undoubtedly an English example; it is also carved in low relief, and is of much more substantial character than the former.

CHIPS.

An appeal to Old Cheltenham and former residents in Cheltenham made by the vicar and churchwardens of Leckhampton for help to complete the unfinished tower and spire of the parish church, as a memorial to the late Canon Hutchinson, for 37 years vicar of the parish.

The King is having 30 or 40 cottages built on the Crown Land at Windsor for labourers on the Royal Estate. The men have been paying 5s. and 6s. a week rent for houses owned by private persons; but the rent of the King's cottages will be only half a crown a week, with the stipulation that no lodgers are to be taken.

The county council of Kent have approved the principle of contributing, under the Military Lands Act, up to two-thirds of the cost of erecting drill-halls in various parts of the county. The first application has been received from Maidstone, and on the council receiving assurance that the drill-hall would be for the joint use of all local Auxiliary Forces, they agreed to contribute £2,000 towards the cost. Both the land and the building will be conveyed to the council.

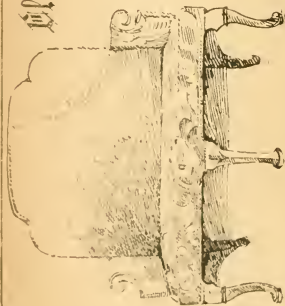
The North Isles District Committee of the County Council of Orkney, at a meeting held at Kirkwall last week, decided to instruct Mr. Heilde, engineer, to prepare the specifications for the construction of a pier on the shore of St. Olaf. It is expected that the building of the pier will be gone on with in the course of a few months.

A new science school has just been completed at Burntisland at a cost of £5,000. The building, which is placed on the playground of the Board school, is in Gothic style, about 60ft. square and four stories in height. On the ground floor are two classrooms, manual-instruction room (furnished with carpenters' benches, clockrooms, and lavatories). A mezzanine floor is utilised for the master's private study, and a store room, and on the upper floor are three classrooms, lecture-room, and chemical laboratory.

The erection of the new boardroom and offices for the Holywell Board of Guardians—on a site adjoining the main workhouse building—has been commenced by the contractor, Mr. Richard Jones, the plans having been prepared by Messrs. J. H. Davies and Sons, architects, Chester. The cost, including a receiving ward to be added to the workhouse, will be about £1,800.

The British Schools, situated in Fore-street, Liverpool, having become inadequate in accommodation, the trustees acquired the Hermitage, with its house and grounds with entrances from High-street and Wilder-road, at a cost of £3,108. The old school will be used for infants, the elder boys and girls being educated at the Hermitage, which was formally opened last week. Mr. Allen Russell is the architect, and the contractor is Mr. W. Smyth.

Old English



QUEEN ANNE SETTE IN
ROSE DRESSING

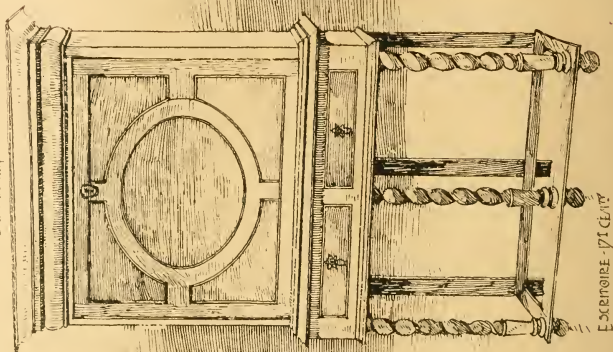
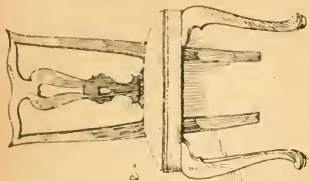


EXCURSION OVEN

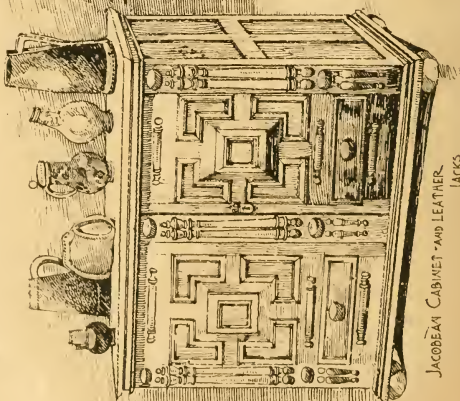
Furniture

17th and 18th Cent

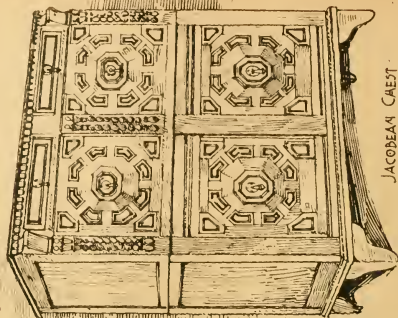
- OLD MAHOGANY CHAIR -



EXCURSION 17th CENT



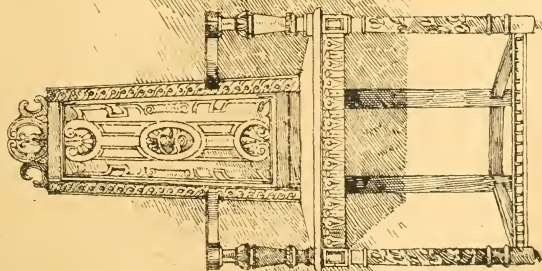
JACOBÉAN CABINET AND LEATHER
JACKS



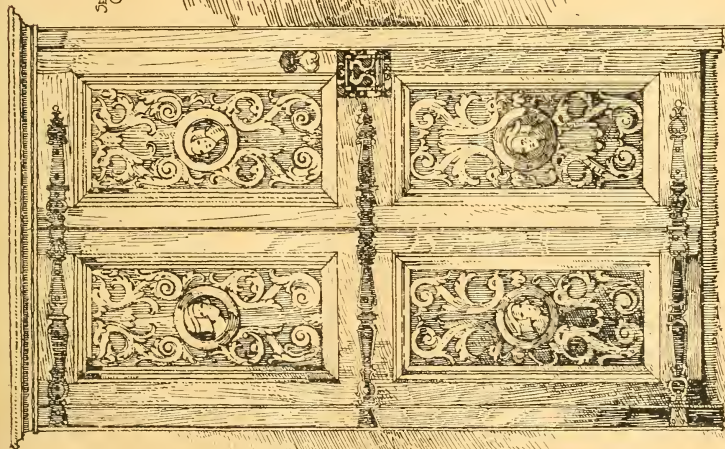
JACOBÉAN CHEST

W. J. J. & Co.

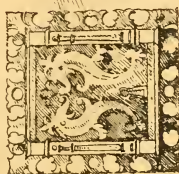
FURNITURE FROM MESSRS
CARISTIES SALE ROOMS...



- WALNUT WOOD CHAIR, FRENA
LATE 16TH CENTURY.



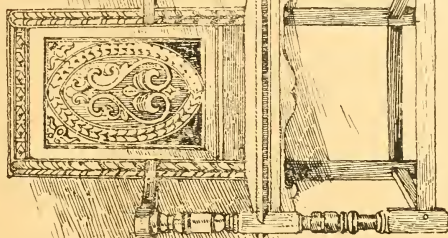
- AN OAK ARMOR -



DETAIL OF LOCK
PLATE RAISED.



SECTION OF
CORNICHE.



OAK ARM CHAIR
DATE ABOUT 1650.

Detail

Engineering Notes.

COMRIE AND ST. FILLANS RAILWAY.—Colonel von Donop, R.E., of the Board of Trade, officially inspected, on Friday, the Comrie and St. Fillans section of the Leuchmarch railway, Colonel von Donop was accompanied by a number of the leading officials of the Caledonian Railway Company from Glasgow and Perth, with Mr. Crouch, of Crouch and Hogg, the engineers. Three heavy engines were used in testing the permanent way, and particularly the numerous bridges along the line, there being ten girder bridges in the course of the six miles of railway, and four of these span the River Earn, and one the River Lednock. The line has cost £78,000, or £13,000 per mile. The track for the section between St. Fillans and Leuchmarch, where the line will connect with the Callander and Oban Railway, is costing £113,000, or rather less than £13,000 per mile. The construction of this section, it is anticipated, will occupy from two and a half to three years. Messrs. John Paton and Co., of Glasgow, are also the contractors for this section, and already they have made great progress with the work. The Comrie and St. Fillans section has been opened for public traffic during the present week.

NEWCASTLE-ON-TYNE.—Considerable progress is being made with the great scheme which is to connect the Wyllyth and Tyne Railway with the Central, and which is to transform out of recognition the New Bridge-street neighbourhood. At present a gap yawns where once stood Victoria-place and the greater part of Pleasant-row. This gap is being widened in the housebreakers daily attack Adelaide-place in the direction of Shieldfield. In order to form the junction, the New Bridge-street traffic and travellers must be diverted, and the dip in the old road, which has its lowest level at the centre of the bridge, will be raised by 7 ft., so as to enable the connecting lines to the Central Station to be carried underneath the main thoroughfare to Byker. As yet, only a portion of the connecting property has been razed to the ground. Soon there will be nothing standing between Christ Church in Shieldfield and St. Peter's in Oxford-street. Continuing the work of demolition, there will shortly fall the whole of Adelaide-place, the west side of Shieldfield Green, and the entire west side of Falconer-street. Here will be erected a new goods station. This will be double the size of the Trafalgar Station, and it will be provided with the latest electrical appliances. The new passenger station will occupy the bed of the existing valley, and will extend from New Bridge-street southward to the west-end of Trafalgar goods station. It will have V-shaped platforms, some 600 ft. in length. Trafalgar-street, opposite Carlisle-place, will see the main entrance to this new important station. The site of the Trafalgar Goods Station will be used for a depot for fruit, while the Wyllyth and Tyne Station will eventually make way for the projected mineral sidings and rearranged coal depots. Mr. Nowell is the contractor for these works, which are being carried out from plans by and under the direction of Mr. John Oliver, architect to the North-Eastern Railway Company.

The foundation-stone of a Salvation Army Citadel was laid in Queen Victoria-road, Coventry, on Monday. The building will seat 350 adults, and at the rear is to be a separate hall for 200 children. The contract for building has been taken at £2,176 by Messrs. McCarthy and Co., Coventry.

The most destructive fire that has occurred in London since the memorable Cripple Creek conflagration on November 19, 1897, occurred on Saturday afternoon in Bunhill-row, St. Luke's. The scene of the disaster was a block of premises bounded by Chiswell-street, Bunhill-row, and Lamb's-escape, and the fire broke out at half-past two o'clock upon the premises of Messrs. W. H. Laxelles and Co., a well-known firm of manufacturing joiners. Originating in a back building of three floors, 20 ft. by 60 ft., which was used by the firm for the general purposes of workshops, stores, sawmills, and engine and boiler house, Messrs. Laxelles' property was soon hopelessly involved, and the fire spread to four houses, 15 ft. by 50 ft., was burnt out, and the huge timber-work of Messrs. Oliver and Sons, in the street, was seriously injured. The damage exceeds £120,000. Messrs. Laxelles inform us that they have transferred their journey department to their work at Stratford, and are prepared to manufacture at once as before.

Intercommunication.

QUESTIONS.

[11778.]—Adjoining Owners.—A. the owner of a plot of land containing four houses, sits two to B. and two to C. A covered way on the ground of B. divides the division-wall to the back, and through which C. has a right of way. Now, as B proposes to rebuild his property, and carry the same up, has he any legal right to do so?

build up on the said division-wall, leaving the passage as before. B's bed-room extends over the covered way, and the division-wall carries the beams, lintels, &c., of the same. Nothing is mentioned in deeds as to whether the wall is a party-wall, but the division of land is the centre of division-wall (see sketch enclosed).—E. W.

REPLIES.

[11777.]—Rough-Cast for External Work.—Rough-cast, which is used for ornamental panneling in modern houses in England, is frequently applied to the whole of the rubble walling of ordinary houses in Ireland. Yard walls, and even stone fences along public roads, are also finished with it, excepting, of course, the coping. A good house front may have cement architraves run round the windows and doors, the intermediate wall-spaces being plastered and rough-cast. In Ireland this kind of work is called "dashing," obviously because the material is dashed or thrown against the wall. Rough-cast is a semi-liquid mixture of lime, gravel, and water, which is dashed against the wall with a trowel of peculiar shape—a wooden spoon, in fact, about a square, which is dashed against the wall with a trowel of peculiar shape—the flat part being dashed out at the handle side to hold the liquid mixture. Rough-cast may be applied direct by one rough wall, such as rubble work in thin stones with open joints, or the wall may be roughly plastered and the rough-cast thrown on it. To rough-cast on a sleek, smooth framing is a more complicated matter. The framing must be close-boarded with lin. straight-joint flooring or rough boards, and covered with some waterproof material, such as felt or Willden paper. Ordinary slating battens, 1½ in. by 3 in., should be nailed diagonally across the latter, and these in turn should be crossed with plastering. The battens may be 4 in. apart, and the laths, as they are usually fixed on a stud partition, spaced to key the plastering. The lathed surface must be finished like ordinary three-coat plastering, render, float, and soot, but substituting for the setting the rough-cast or dashing. Imitating the oak framing of Old English half-timber work in cement is an abomination to be studiously avoided.—W. E. M.

The Sanitary Institute, which has been housed for the last quarter of a century at the Parkes Museum, Margaret-street, Oxford-street, W., has quite outgrown the accommodation provided for it and has decided that it is now resolved to erect a home fitted for the carrying on of its important work. It has a membership now of 2,500.

There was a large gathering in Durlington Public Park on Friday on the occasion of the starting, by Sir Joseph Pense, M.P., of a clock given by Messrs. Potts, the well-known clockmakers of Leeds. It had long been felt that a clock should be provided in the park, but no action had been taken in that direction when Messrs. Potts intimated that they would be happy to give a clock to the park if the corporation could provide a place for its reception, in memory of their father, who was a native of Durlington. The offer was at once accepted, a place was found in the gardener's house, and in it the clock has been placed.

At the Norwich Consistory Court, last week, citations were issued for restoring the parish churches of Wymondham and West Dereham. As to the latter church, it was mentioned that on April 25 last the roof of the church was destroyed by the fire. The church consisted of nave, chancel, south porch, vestry, and circular western tower. The whole of the church, except the tower, was a late 15th-century structure, and it was proposed to at once construct and fix a new timber roof to the nave, and to cover it with tiles, to rebuild the gable over the chancel arch, and the half gables next the tower, and to generally repair the building at a cost of £192. The rest of the work would be carried out as funds permitted.

LEGAL INTELLIGENCE.

THE TREMA MANSIONS AWARD.—Mr. Godfrey Pinkerton has now published his award in the matter of the dispute between Mr. John Thomas Hockley, of Grantham, builder (trading as R. Hockley and Son), and the trustees winding up his estate, Messrs. John Simpson (Grantham) and J. T. Medcalf (London), against Henry Metcalf and Thomas R. Greig, trading in co-partnership as architects in London. The dispute arose on a contract entered

into by Hockley and Metcalf and Greig to build some large flats, known as the Tremas Mansions, South Kensington, London, for the sum of £25,762. Hockley did a large amount of work on the contract, but, in consequence of the failure on the part of Metcalf and Greig to keep up their payments, he stopped work and ended the contract. Over and above the amount paid by Metcalf and Greig prior to the stoppage of the works, Hockley claimed there was due for work actually executed, a large sum of money. It was also claimed that Metcalf and Greig had been guilty of a breach of contract, and that Hockley was justified in putting an end to the same, and was entitled to damages from Metcalf and Greig for loss on plant, &c., and of profit on the contract. On the other hand, Metcalf and Greig contended that Hockley had been fully paid for all the work he had done, that he was not justified in stopping the work, and that he had committed a breach of contract, and they claimed over £5,000 damages for their loss in consequence. The Arbitrator decided and adjudged—(1), that the sum of £22,925 18s. 9d. was due from Metcalf and Greig in respect of the work executed by Hockley, the value of which he fixed at £17,169 18s. 9d.; (2), that Metcalf and Greig should pay the sum of £764 for loss incurred by Hockley upon plant and material supplied on the contract; (3), that there was no ground due from Hockley to Metcalf and Greig in respect of damages claimed by them; (4), that Metcalf and Greig should pay the costs of, and incidental to, the reference and the costs of the award, as between party and party; (5), the Arbitrator also decided that there had been a breach of contract on the part of Metcalf and Greig, and that Hockley was entitled to the sum of £1,183 for loss of profit on the contract, the total sum under which Hockley would have been entitled to be paid, had he completed it, amounting to £29,000. As regards the last item of the award, the Arbitrator reserved a power of revision, in the form which is set forth in a special case stated by the Arbitrator to the High Court, as to whether, on the facts stated therein, Hockley is entitled to be paid the sum representing the loss of profit, or any part of such sum, and the value of the special case to be left to the Court. The first part of the award will be enforceable forthwith, but the special case will have to be argued after the Long Vacation, as soon as the same has been brought on, Mr. Theodore Norton (Grantham) was the solicitor acting for Hockley and his Trustees, and Messrs. Morris and Richards (London) were solicitors for Metcalf and Greig.

THE DEFINITION OF A NEW BUILDING.—The Bromsgrove magistrates were occupied on Tuesday in deciding a case in which the Bromsgrove Rural District Council prosecuted Frederick Lacey, a builder of Bromsgrove, for having commenced to erect a new building at the Church Mills, St. Luke's, the property of the executors of the late Mr. John Corbett, without having first submitted plans and given notice of intention to build in conformity with the council's by-laws. The Bench considered the evidence was a new building within the meaning of the Act, and for the technical offence that had been committed they imposed a fine of 1s. and 10s. 6d. costs. The chairman said the magistrates would be prepared to state a case upon the point.

Morley Corporation have given a commission to Messrs. Francis Durlington, of Kensington, Genl. London, to execute a marble bust of Queen Victoria, to be placed in the main staircase of the town-hall.

Our Office Table.

In connection with the paper to be read before the London Architectural Association in February next by Miss Ethel Charles, A.R.I.B.A., pleading on behalf of the Transatlantic architecture, we note in a Transatlantic contemporary that Miss Josephine W. Chapman, of Boston, a successful woman architect, will be the only representative of her sex at the Pan-American Exhibition in Buffalo. Miss Chapman has erected a number of churches, business buildings, and residences. The significant admission is made, however, that Miss Chapman employs none but men in her office, as she declares that women fail to give their undivided attention to the work, and at the most critical moment want to go home to make their clothes. Miss Chapman really ought not to give away her sex in this fashion.

The eighth annual convention of the National Association of House Painters and Decorators will be held at Leicester on Oct. 1, 2, 3, and 4. On Tuesday, the 1st prox., a meeting will be held at the Exhibition-hall, when the Mayor will welcome the members, and afterwards Mr. John W. Barker, the President, will deliver his address. In the afternoon a business meeting will take place in the Temperance-hall, when reports will be presented by the secretary, treasurer, the Paperhangers and Education Committees, the members of local associations, and a paper on "What to Teach Our Apprentices" will be read by Mr. H. Cooke, of Hull. A reception will be given in the evening by the president and Mrs. Barker at the Grand Hotel. On Wednesday, the 2nd prox., a specially-prepared address will be delivered by Mr. Walter Crane, entitled "Some Thoughts on House Decoration"; and in the afternoon Mr. Fletcher, head master of the Leicester School of Art, will give a blackboard address on "The Value of Design and Retention in Decoration." The election of officers and committees will follow, and in the evening the Mayor will give a reception at the Art Gallery in Hastings-street. An excursion to Belvoir Castle, the seat of the Duke of Rutland; with lunch at the Peacock Hotel, is arranged for Thursday, the annual dinner following in the evening at the Grand Hotel, Leicester. Other excursions are planned for Friday.

The city council of Manchester have appointed a special committee to consider the whole question of sewer ventilation. The inquiry is not premature, for, according to a report submitted by the city surveyor, there are 1,700 miles of sewers in Manchester that urgently require ventilation. It has been proposed to ventilate them by means of shafts which would be connected with the sewers in the proportion of 14 to the mile. There would, therefore, be required 23,800 shafts, and the cost would be something like £399,400. Several members doubted whether the system would prove in practice a perfect one, and in view of the large expense the council have agreed that fresh consideration should be given to the scheme in committee.

MR. E. H. WITTENSTROEM, till recently Agent-General for Western Australia, returns to the advocacy of jarrah and karri woods for street paving apropos of the recent selection by the city council of Westminster of American red gum in preference to Australian eucalyptus for the pavement in Whitehall and Piccadilly. After tests of over fifty years, subjected to every conceivable exposure to weather and insect, Mr. Wittenstroem has seen jarrah as sound as possible, and he pronounces both jarrah and karri among the best, if not the best, hard-woods in fact, imposed on, however, for the sake of argument, that Australian and American woods are equally adapted for street paving, he urges that the preference should be given to Australia. America is a country that gives no encouragement to British trade or manufactures, in fact, imposes the highest possible duties against them, and is our most formidable commercial rival. Australia, on the other hand, carries on a large trade with Great Britain, and is a considerable customer for British manufactures. It might be argued that Australia taxes British goods in the same way as America does; but in the majority of cases this is for revenue purposes and not for prohibition, besides which there is a considerable free list. Some little time ago tenders were called for the supply of over a million pounds' worth of steel joists for Western Australia. This contract was

ultimately placed between Germany and America owing to the disinclination of British manufacturers to undertake the order. A section of the London Press criticised this action adversely with considerable vigour, contending that, as the colonies actually send their money home to Great Britain, they should make their purchases there. He therefore suggests that criticism of a similar character would apply equally to the borough councils and vestries of the United Kingdom, who might also show some reciprocity to the colonies, especially when, as in the case of the Westminster City Council and the American red gum, there is, in their opinion, so little difference between the articles required.

EXPERIMENTS made with concrete in America go to prove that in certain cases it is better to make the mixture too wet than too dry. Two sets of blocks were made; in one case the water put in was 82 per cent. of the volume of cement used, and in the other 44 per cent. The two specimens being 1 of cement, 2 of sand, and 5 of crushed stone. The wet cement was so sloppy as to be awkward to handle, while the dry could only be made to quake slightly after hard ramming. The wet mixture took only 20 minutes to set, and was as hard as the dry. The concrete resulting from the first mixture when set was much smoother on the outside and more homogeneous inside than that from the second. These experiments, combined with experience in the laboratory and in the manufacture of artificial stone, justify the very large range of water, such as bridge foundations or dock walls, where very close ramming is difficult, a wet mixture is best; but for small blocks, such as artificial quays, &c., where ramming can be carried to any point desired, and where the mixture is more confined much less water is needed.

The excavations which are being conducted at Canterbury on the site of the eastern portion of the great St. Augustine Church formerly stood close by the Monastery of St. Augustine are awakening considerable interest. Some of the objects which have been found are on exhibition at the Reaney Institute, Canterbury, including the skull and mitre of Abbot John Dygon, who died in the year 1510. It was at first thought that this would be the head of the Duke of York, which, it is known, was kept separate from the body, being exposed for the veneration of the faithful. This theory, however, had to be abandoned when the skeleton of the body was discovered, and also the coffin-plate—a large plate of lead, bearing the Abbot's name. The body appeared to have been robed in full pontifical for burial; but, owing presumably to the poverty of the monastery at that period of its history—the time of Henry VII.—the inmates were unable to give the Abbot a real jewelled mitre or gold ring. The fingers of the Abbot's hand, which were encased in jewels: the episcopal ring on one of the fingers is also of base metal, and the chalice and paten are of lead. But little is known of Abbot John Dygon beyond the fact that he was one of the honoured guests who sat at the high table at Bishop Warham's enthronement banquet in 1504.

We are very glad to be able to announce that the calamities fire at Messrs. W. H. Lascelles and Co.'s premises, 121, Bunhill-row, last Saturday, will not interfere in the least with their business. Messrs. W. H. Lascelles and Co. have had well-deserved and kindly sympathy from all quarters, and have secured the premises lately occupied by Messrs. W. Scrivener and Co., which with their own works at Stratford, will prove adequate to all requirements. Communications should be still addressed to 121, Bunhill-row, as heretofore, as, happily, the offices escaped the otherwise disastrous conflagration.

It is also very gratifying to be able to state that the fire has not in any way damaged the interior of Messrs. W. Walker and Sons' premises at 119, Bunhill-row, and that their stock of furniture is intact, and business is being carried on as usual. Messrs. F. McNeill and Co. have suffered considerable damage, but are continuing business without interruption, and so are Messrs. W. Oliver and Son, of 120, Bunhill-row, though the effects of the fire on their premises were serious. Three-fourths of their stock is destroyed, but their front stage and contents in Bunhill-row was mostly saved, and all is covered by insurance. Their stocks at other yards and wharves will enable them to meet all requirements.

The Trades Union Congress, at the closing

meeting held in Swansea on Friday, unanimously passed a resolution, on the motion of Messrs. W. C. Steadman and Walsh, declaring that the housing question demands drastic solution, and calling upon the Government to amend Parts I and II of the National Housing Council, and to make provisions for dealing with the owners of unhealthy houses to extend the time for repayment of loans to 100 years, and the establishment of fair rent Courts. The congress endorsed the principles contained in the Bill promoted by the Workingmen's National Housing Council, and introduced into Parliament by Dr. Macnamara, for the purpose of amending the law relating to the housing of the working classes, and demands of the Legislature that no time be lost in dealing with overcrowding and excessive rents. The members further indicated the Parliamentary committee to press the Government for facilities and support for the passing of this Bill in the next session of Parliament, and to take steps with a view to the amalgamation and concentration of labour forces on the housing question. Mr. Steadman, in the course of his address, expressed on the congress that before tackling the housing question in a thorough manner they would have to settle the land question.

The Willis-avenue Bridge across the Harlem river at 127th-street, New York, recently finished, is expected to be one of the principal links between the boroughs of Manhattan and Bronx. It is a fine example of the new type of bridge structure, which was commenced over three years ago, and has cost about £170,000 sterling. It is 2,507 ft. long, and 66 ft. wide, with a 42 ft. roadway and two 9 ft. sidewalks paved with asphalt. It has a 304 ft. draw span, a 216 ft. fixed river span, five spans of 100 ft. spans, and a 100 ft. pier abutment pier. The bridge is supported by 10 piers from the 60 ft. turntable draw on which the load is equally distributed at twenty points. The pivot pier has annular masonry walls 11 ft. thick and 70 ft. in external diameter, with a pneumatic caisson foundation. The bridge is raised and lowered by a system of 100 ft. long, 10 ft. wide steam plant for operating the turning gear and the electric-lighting plant. The bridge was designed by the late Mr. T. C. Clarke, consulting engineer, and the superstructure was built by the Edge Moor Bridge Company.

The town council of Suffolk discussed at their last meeting a recommendation from the General Purposes Committee "that the council be recommended to direct Mr. Corbett to resign his position as borough engineer and surveyor of this borough." A letter was read from Mr. Corbett asking the members to give further consideration to the matter, on the ground that the works in connection with the scheme for completing the sewage works of the borough were well advanced, but not yet completed, about £60,000 out of a contemplated £75,000 having been expended thereon, and that he was very desirous of completing the work, getting the credit for its design, and receiving the pecuniary benefit of the Sewage Corporation, which they would then, no doubt, grant to be fairly due to him. After considerable discussion it was agreed to postpone consideration of the duties of the borough engineer until the sewage works should be finished.

MESSRS. HAYWARD BROS. and ECKSTEIN, LTD. have sent us a catalogue of their "Allinson" self-acting ventilators, the goodwill, pattern, and design of which have been acquired, and which they strongly recommend for quality, strength, efficiency, and economy. They are made of strong best steel, galvanised, and painted with enamel paint. A variety of patterns are shown in the catalogue, together with others of iron, tubes, panels, and cast-iron.

To plan the architecture of the proposed exhibition at St. Louis, Miss., several architects of New York, including Cass Gilbert and Carrère and Hastings, had an interview, a fortnight since, with Isaac S. Taylor, Chairman of the Board of Commissioners and Director of the Exhibition. Mr. Henry Walker, of Boston, and J. Knox Taylor, Supervising Architect of the Treasury Department, who will design the Government buildings. They have settled of the ground plans for the Exposition. The site will include 610 acres of Forest Park and other

land, making 1,100 acres in all. The style of architecture adopted is the Italian Renaissance freely treated. The architects expect to give out contracts amounting to £1,400,000 to £1,600,000 sterling this autumn. The city of St. Louis gives £1,000,000, the subscription fund now amounts to another million; the State of Missouri has given £200,000, the United States will give £1,000,000, and will expend £55,000 besides on the Government building. The entire cost of the Exposition will be about six millions sterling.

The Bishop of Llandaff, on Monday, reopened the parish church of Llandenny, near UK, which has undergone extensive restoration. During the work the removal of a Medieval buttress beneath a window, which is believed to be one of the very few fragments of pre-Norman church architecture remaining in the Principality. The opening is only six wide, the inner spay broadening considerably. A new pulpit has been erected by the parishioners in memory of Queen Victoria, and the lych-gate, which is one of four early examples existing in the diocese, has been restored in memory of Captain Richard Fitzroy Somerset, Grenadier Guards.

The church of St. John, Longton, Staffs, which two years ago was almost a total ruin, is now being re-erected internally from plans by Mr. Beckett, architect. The reopening will take place on Sunday next, the 15th inst.

Mr. F. H. Chaplin has forwarded his resignation the appointment of borough electrical engineer under the Southampton Corporation. The resignation has been accepted, and the town council are advertising for applications for the appointment, at a salary of £500 per annum.

On Sunday a stained-glass memorial window was dedicated in St. Cuthbert's Church, Colchester. The subject of the design is the death of the Rev. John Worsley, which has been placed in the chancel, is Early English in style. The architect was Mr. Streeter, Kensington, and the manufacturers Messrs. Savell and Co., London and Cambridge. On the north side of the window is a brass tablet containing an inscription.

It now seems that neither Walsdale nor Lullington possesses England's smallest church. The village of Uplatham, near Saltburn, North Yorkshire, claims this honour, for its church measures only 17ft. 9in. by 13ft. 9in.

The London United Tramways Company, Limited, who have already obtained Parliamentary powers for the construction of over sixty miles of electric tramways in Middlesex and Surrey, some of which are now in working, have now in preparation for next session a Bill seeking further power to construct some forty additional miles of line, chiefly in the administrative county of Surrey. The Company propose to do so to Mortice, Richmond, Petersham, Kingston Vale, Esker, Ewell, Wimbledon, Epsom, Merton, Morden, Mitcham, Carshalton, Croydon, Sunbury, &c. If carried out, these lines would connect with Kenning Park, Sandown Park, Hurst Park and Epsom Downs, and would, therefore, extend largely for race traffic.

The municipal buildings committee will recommend to the meeting of Valsall Town Council on Monday next, that the tender of Messrs. Armitage and Hodgson, Leeds, to erect the new premises for 250 workmen. The plan of the buildings, which were adopted are those sent in by Mr. James S. Gibson, include new council chamber and committee-rooms, offices for the various corporation officials, and a new tower to accommodate about 1,700 people, and are drawn so as to permit the erection of an art gallery in the future if desirable.

A memorial stained-glass window, which has been placed in Birkenshaw Church by the widow of the late Mr. John Emmet, F.L.S., of Boston Spa, was formally dedicated on Saturday. The window is the work of Messrs. Emmott Brothers, of Leeds.

Newport Corporation on Saturday opened their new branch line from the General Post Office to Jewellery Hill.

A stained-glass window has just been placed in the Ballincree Church to the memory of the late Mr. C. J. C. The window is in the south aisle, and immediately to the west of the porch. It consists of two lights in the Early Decorated style. These are filled with two illustrations from the New Testament, that on the left from St. John viii, 12, "I am the light of the world"; that on the right from St. Luke x, 42, "Mary hath chosen that good part." The work is from the studio of Messrs. Triggs and Sons, The Close, Exeter.

Lady Estlin Smith has accepted an invitation to attend, in Portsea Parish Church, on 10th inst., a service which has been erected at the cost of the relatives of some of those who have served in South Africa. The dedication service will be conducted by the Rev. Canon Stegney.

Trade News.

WAGES MOVEMENTS.

LIMBERG.—Seven members of the local branch of the Amalgamated Society of Carpenters and Joiners were arrested on Thursday, on information sworn by Mr. Alfred Gough, master builder, that they were in a conspiracy, assault, and intimidation arising out of the strike of carpenters for higher wages. The complainant alleged that the defendants forcibly took away one of his workmen. They were remanded on bail at the police-court by Mr. Hall. In connection with the case Messrs. Connolly, solicitors for Mr. Gough, have served notice on Mr. Corrigan, delegate of the Carpenters' Society, stating that, following the decision of the House of Lords in the Taff Vale Railway case, the Carpenters' Society would be sued for damages.

CHIPS.

It is stated that unexpected engineering difficulties are presenting themselves with regard to the construction of the proposed Solent tunnel between the mainland near Lymington and Freshwater in the Isle of Wight, for which Parliamentary powers were obtained last session.

A stone building with clock tower, which the London City and Midland Bank, Limited, have erected at the junction of North-street and Meander-street, Leamford, was opened for business on Monday. Mr. W. W. Bakewell, of Leeds, is the architect.

A new boat and shoe factory is about to be built in Sandon-road, Stafford, for Messrs. E. Bostock and Co., Limited. The building will measure 310ft. by 50ft., and will be three stories in height, besides basement. Including out-offices, an area of 2,000 square yards will be covered. The contract for the foundations up to the ground floor of the factory has been let to Messrs. W. Moss and Sons, Limited, of Loughborough, and work has been commenced this week. Connected with the main building will be three external towers, two fitted with lifts, staircases, and conveniences, and the other in the centre with a staircase only. The architects engaged are Messrs. W. H. Stimpson, of Leicester, and Mr. H. T. Sandy, of Stafford, and it is the intention of the firm to expedite the erection of their new premises as much as possible.

The first motor fire-engine used in England was delivered to the Mayor and Corporation of Ecdes on Monday. The engine is intended for first-aid, and carries six men, four ladders, hose, and all necessary appliances. According to the contract, it is to carry this load fourteen miles an hour, and ascend any gradient in the borough. It is worked by electricity and oil sparking combined, has a maximum speed and reversing gear, and powerful brakes.

The third International Congress for the Testing of Material in Technics, in which four hundred delegates, including German, French, and English scientists, are taking part, was opened at Budapest on Monday, and was closed yesterday (Thursday). Mr. B. H. Brough, general secretary of the Iron and Steel Institute, was elected honorary president for England, and Professor Howe, of New York, honorary president for America.

The public baths, which have been erected at the corner of Church-street and Summertown-road, by the Govan Town Council, were formally opened on Saturday. Both the ladies' and the gentlemen's swimming ponds are of the regulation size, 75ft. by 40ft., the former having a depth of from 2ft. 6in. to 4ft. 6in., and the latter from 4ft. 6in. to 8ft. 6in., with a diving ladder 13ft. high at the deep end. The scheme involves a capital expenditure of between £24,000 and £25,000.

Mr. J. R. Singleton, of The Knott, Undercliffe, Leeds, the well-known firm of millwrights, ironmongers, timber merchants and sawmill owners, of Bradford, Halifax, and West Hartlepool, died on the 1st inst., in the 84th year of his age.

The list of adjudicators in bankruptcy in Friday's *Gazette* includes the name of John James Weibking, St. John's Works, Southgate-road, Ilford, N., Sherborne-street, Islington, N., and Whitmore-road, Hoxton, N.E., builder and contractor.

Lieutenant-Colonel Von Donop, of the Board of Trade, inspected and passed at Aberdeen on Saturday the recently electrically equipped sections of the Aberdeen tramway line to Mannofield and the Bathing Station.

The School Board for London requires the services of additional manual training instructors and assistant instructors in woodwork in the day schools. Applications should be received by the clerk at Victoria Embankment by Thursday, 20th inst.

The tower and bells of the ancient parish church at Altringham, near Wolverhampton, have just been completely restored at a cost of some £350. Two of the bells were recast, and the new fittings adjusted by Mr. James Barwell, of Birmingham.

Mr. Eames, of Bridgwater, has been elected district surveyor of Bridgwater at a salary of £225 a year.

At Cadworh, near Grimsby, a Methodist New Connexion school-chapel is being erected to meet the needs of a rapidly-growing colliery population. The architect is Mr. P. A. Hinchcliffe, of Barnsley, and the memorial-stones were formally laid last week.

The Bristol City Council have decided to enlarge the isolation hospital at Ham-green, near Portishead, by the erection of additional buildings to accommodate 63 patients, raising the total number of beds at this institution from 76 to 139, which, with the 61 beds at the Novers, will give isolation hospital accommodation for 200 patients. The cost of the extension is estimated at £24,700.

Professor Lorrain Smith, of Queen's College, Belfast, has just completed his report to the corporation of that city on a bacteriological investigation of the experimental contact beds for sewage treatment. In it he gives results which are of some degree to simplify the sewage question as it presents itself in Belfast, and which may be suggestive to other municipal authorities approaching a similar problem.

THE ARCHITECTURAL ASSOCIATION.

THE DAY SCHOOL will OPEN on MONDAY, October 14th, 1901. Entrance pupils are requested to forward their names to the Secretary at earliest opportunity.

THE EVENING SCHOOL also OPENS on OCTOBER 14th.

A pamphlet, containing full information and nomination forms for membership, may be obtained upon application to the SECRETARY, at 56, Great Marlborough-street, London, W.

H. P. GAULFIE, Secy. H. P. GAULFIE, J. Hon. Secs.

The Society of Architects.

Founded 1884. Incorporated 1893.

An EXAMINATION to qualify for MEMBERSHIP will be held on OCT. 8, 9, and 10, 1901, at ST. JAMES'S HALL, PICCADILLY, W. Entries close SEPT. 27th. Syllabus free. Past Examination Papers 2s. 6d. each.

C. MCARTHY BUTLER, Secretary, Society of Architects.

FIRE IN BUNHILL ROAD.

W. H. LASCELLES & CO.

Big to thank their many friends who have expressed their sympathy and offered practical assistance in their difficulties arising from the disastrous Fire on Saturday last. They have secured the premises lately occupied by Messrs. W. Scrivener & Co., which, with their own premises at Stratford, will enable them to continue their Joinery business without any delay.

Communications are still to be addressed to their Old Address, 121, BUNHILL ROAD, LONDON, E.C., as the Offices have escaped serious injury.

The "LASCELLES" Concrete Work and other Departments which are carried on at their Stratford Premises are not interrupted.

CHAPPUIS'

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69, FLEET STREET, LONDON.

LIST OF COMPETITIONS OPEN.

Blackpool-Laying-out Land at Cemetery Rosemeaden-Cottages, limit £110 each	£30, £15, £5	The Borough Surveyor, Town Hall, Blackpool	Sept. 16
Chelms, S.W.-Public Baths, King's-road	1000s. merged, 500s., 200s.	T. J. O'Keefe, Clerk, Rosemeaden	21
Camberwell, S.E.-Baths and Washhouses, Old Kent-road	500s., 750s., 500s.	The Public Baths Commission, 171, King's-road, Chelsea, S.W.	Oct. 1
A. Saxon Sell, F.R.I.B.A., Assessor			29
London, N.W.-Hearts of Oak Society's New Offices, &c.	£100 merged, £75, £30	The Town Clerk, Town Hall, Camberwell, S.E.	
Fusion-road limit £500			
St. Peter Port, Guernsey-School 750 places		Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, Adelphi, W.C.	Nov. 15
Walton-on-Thames-Municipal Buildings, Fire Station, &c.	£20, £20, £10 10s.	The Rev. G. E. Lee, Rector, St. Peter Port, Guernsey	
Cardiff-Chapel, Cathedral-road east £500		P. H. White, U.D.C. Clerk, Walton-on-Thames	
Middlesbrough-Mission Hall, School, and Classrooms		Thomas Evans, 193, Colindale Avenue, Wembley	
		W. R. Meppeson, Woodlands-road, Middlesbrough	

LIST OF TENDERS OPEN.

BUILDINGS.

Llanfair-Elan-Business Premises	W. Eames, Grocer	Richard Davies, Architect, 125, High-street, Bangor	Sept. 14
Western Valleys, Mon.-Forty Houses	Co-operative Society	C. Telford Evans, Architect, 8, Queen-street, Cardiff	14
Hutton Downs-Premises		Wm. and T. R. Millburn, Architects, 20, Forewell-street, Sunderland	14
Barnesley-Two Houses, Beech-street		C. W. Leycock, 25, Ship-street, Holly Bank, Barnsley	16
Lincoln-Roller-Shop, &c.		London, Procter, and Co., Sheet Ironworks, Lincoln	14
Perth-Houses for Working Classes	Town Council	M. K. Milson, Bangor Surveyor, 12, Tay-street, Perth	14
Burton Lettmore-Two Houses		C. Brown, Burton Lettmore	14
Little Houghton-Engine-House, &c.	Deane Valley Colliery Co., Ltd.	Chilke and Rowand, Mining Engineers, Wakefield	14
Barnsley-Four Houses, Sheffield-road		B. J. Laycock, 187, Sheffield-road, Holly Bank, Barnsley	14
Stanton-Alterations to Parish Church	Miss South	Henry Charlesworth, Architects, Westgate-road, Newcastle	14
Blackburn-Rebuilding Farm Premises		C. P. Chambers, 31, Cornwall-street, Barrow-in-Furness	14
Bristol-Warhouses, &c.	No. 3 District Council	Henry Williams, Architect, Imperial Chambers, Bristol	14
Edinburgh-Laboratory Cottages at Killishead and Gortashorra		J. Widen, C.E. Edinburg	14
Kirkcubbin-Shed at Sledmair	General Municipal Charities Trustees	D. Ross, Road Surveyor, Kirkcubbin	14
Coverly-Alterations to 182, Spout-street	Public Parks Committee	Herbert W. Chatterway, Architect, Trinity Churchyard, Coventry	14
Butley-Goods Warehouse, Collier-street		J. Wilson and Sons, Railway Contractors, J. and N.W. Ry., Batley	14
Nottingham-Entrance Lodge, &c., Lenton Recreation Ground		Frank B. Lewis, City Architect, Guildhall, Nottingham	14
Patterdale-Police Station	Town Council	Joseph Birtley, County Surveyor, 7, Lower-street, Kendal	14
Barnsley-Lodge, &c.	School Board	J. Henry Taylor, M.I.C.E., Manor House, Barnsley	16
Houghton Regis-Additions to Upper School	Borough Council	J. R. Brown and Son, Castle-street Chambers, Luton	16
Widmore-House, &c.	School Board	J. Dodgson, Architect, 80, Abdon-street, Leeds	16
Paddington, W.-Mortuary Buildings, &c., Manor-place		The Surveyor's Department, Town Hall, Paddington, W.	16
Mansfield-Littleworth Schools 800 places		Valance and Westwick, Architects, Mansfield	16
Arves-Villa	J. Brice Mullin	James Gibson, Architect, Tarras, Aberdeen	16
Fahan-Three Villas	Borough Council	R. Eccles Buchanan, Architect, Castle-street, Londonbury	16
Paddington, W.-Mortuary Buildings and Chapel		The Surveyor's Department, Town Hall, Paddington, W.	16
Hull-Offices and Warehouse, Collier-street	Public Libraries Committee	Ernest Whitlock, Architect, 26, Scale-lane, Hull	16
Newcastle-upon-Tyne-Cookery School	Carmichael Building Club Trustees	John W. Dyson, Architect, 67, Grey-street, Newcastle-upon-Tyne	16
Newcastle-178 Cottages and 22 Villas		W. Dowdeswell, Architect, John-street, Treharris	16
Donlister-Two Houses	West Riding County Council	Wm. Davis, Architect	16
Kirkbrunn-Huddersfield-Asylum	Guardians	J. Vickers Edwards, County Surveyor, Wakefield	16
Birmingham-Two Cottages and Farm Buildings		Whitwell and Sons, Architects, 23, Temple-road, Birmingham	16
Leeds-Primitive Methodist Chapel, Woodhouse Hill		Howell and Howells, Architects, 10, Collyer-street, Leeds	16
Crumlin, Mon.-Additions to Halfway-street Inn	Webb Bros. and Co., Aberber	L. R. Roberts, Architect, Abercrombie	16
Aberdeen-Foundations, &c., Post-office	H.M. Commissioners of Works	Henders and Aldie, 123, Union-street, Aberdeen	16
Bedford-Road and Wood-street	Gr. Northern Ireland Railway Co.	Wm. James, Architect, 10, Collyer-street, Leeds	16
Barnsley-Villa, Park-grove	School Board	Charles L. McIntosh, Architect, 28, Church-street, Barnsley	17
Amport, Portsmouth-Additions, Church-street School	Guardians	A. H. Bone, Architect, Cambridge Junction, Portsmouth	17
Bedford-Alterations to Workhouse	Urban District Council	Wm. James, Architect, 10, Collyer-street, Leeds	17
Woolstone-Cemetery Chapel		F. Hill Parr, C.E., Surveyor, Council Offices, Walsbridge	17
Ryecliffe-Two Houses		John B. Ford, F.R.I.B.A., Upper Kings-street, Norwich	17
Tringville-Alterations, &c., to Ogmore Valley Hotel	John Bros. Aberebury Brewery Co.	Cook and Edwards, Architects, Masonic Buildings, Bridgford, Glouc.	18
Lambeth, S.E.-Workhouse Kitchen Extension, Princes-road	Guardians	Woodward and Brooks, Architects, 93, Kennington Oval, S.E.	18
Grays-Inn-road, W.C.-Casual Wards	Robert Union Guardians	H. Williams Meller, Surveyor, 17, Fenchurch-street, W.C.	18
Loughlinstown-Alterations to Two Workhouse Wards	Rathdown Union Guardians	P. F. Conner, C.E., Loughlinstown	18
Swansea-Harbour Offices	Harbour Trustees	Talford Strick, Clerk, Harbour Offices, Swansea	18
Falschall-Offices, &c.	Lester, Harris, and Co.	Herbert W. Chatterway, Architect, Trinity Churchyard, Coventry	18
Wigan-Corrupted Iron Building	Guardians	Henry Ackerley, Clerk, 9, Victoria Buildings, King-street, Wigan	18
Ballymacreath-Completion of St. Patrick's Parish Church		Samuel P. Close, Architect, Donegal-square Buildings, Belfast	18
Kirkcubbin-Rebuilding Hotel		John Sim, Architect, Montrose	18
Cully-Ann-United Free Church	The Most Rev. Dr. O'Donnell	D. and J. R. McMillan, Architects, 211, Union-street, Aberdeen	19
Brayor-Additions to Shooting Lodge	Municipal Charities Trustees	Alexander Mackenzie, Architect, King'sway	19
Letterkenny-Diocesan Schools	School Board	O'Callaghan, Architects, 12, Letterkenny	19
Dorchester-Repairs, 9, 10, 11, 12, Prince-st., & 1, West-walks	School Board	A. L. Tilley, Architect, Dorchester	19
Ashford, Kent-Additions to Bever-ward Board Schools	School Board	Jeffery and Lacey, Architects, Ashford, Kent	19
Hand-Roller-House at Ladybridge Asylum	District Laundry and Laundry Co.	W. and J. Smith and Kelly, Architects, 170, Union-street, Aberdeen	21
Mythenhall-Schoolroom	School Board	William J. Williams, Clerk, 1, High-street, Cardigan	21
Ilce-Public Offices, &c.	Urban District Council	Heston, Ralph, and Heston, Architects, Wigan	21
Barnstable-Extension of Imperial Hotel	Bernardsey Borough Council	W. C. Oliver, Architect, Bridge-end, Barnstable	21
Rotherhithe, S.E.-Pulling Down Houses	Urban District Council	The Borough Surveyor, Town Hall, Spa-road, Bournemouth	21
Tyldesley-Iron Works, &c.	Guardians	Wm. J. Matthews, Clerk, Council Offices, Tyldesley	21
Newcastle-upon-Lyme-Station, &c., at Workhouse	Gas Committee	Chapman and Snape, Architects, Newcastle-upon-Lyme	23
Leeds-Alterations to Meadow-lane Gasworks	School Board	R. H. Townsend, General Manager, Gas Offices, Dewsbury, Leeds	23
Walthamstead-Cookery-Room, &c., Wood-street School		F. Prosser, M.S.A., 1, Upper Kings-street, Norwich	23
Norham-Villa	Popular & Steepney Asylum Managers	J. L. Murray Sheriff, East House, Norham-on-Tweed	24
Bromley-by-Bow-Additions to Mortuary at Sick Asylum	Urban District Council	J. and S. F. Clarkson, Architects, 136, High-street, Poplar, E.	24
Tringville-Thirty Cottages		Arthur G. Evans, Architect, 2, Manor-street, Poplar, E.	24
Willesden, N.W.-Generating Station, &c.	Midford & Landchurch Union Guardians	O. Claude Rahon, M.I.C.E., Eng. Public Offices, Dyne-rd., Kilburn	24
Field Brighton-Vicarage	Lancashire Asylum Board	Anstey and Fahon, Architects, Castle Park, Lancaster	24
Greenhall-Alterations to Workhouse	Pembrey School Board	John B. Ford, F.R.I.B.A., Upper Kings-street, Norwich	24
Bainhill-Alterations to Laundry, &c.		James Gornall, Clerk, Rainhill	26
Bury Port-Schools, &c.		Richard Williams, Architect, Bury Port	26
Fellon-Fourteen Houses	Admiralty	Colley Hall, A.A., 21, Northgate, Halifax	26
Whitbait-Casualty Buildings	Clothing Committee	The Director of Works Dept., 21, Northumberland-avenue, W.C.	26
Blackpool-Additions to Destructor Works	Brimley and Frothingham U.D.C.	John S. Brodie, Borough Engineer, Town Hall, Blackpool	26
Frothingham-Casualty Offices	School Board	W. M. Prosser, Architect, 2, Manor-street, Poplar, E.	26
Bristol-Infants School, Wilson-street	Blackwell and Thompson, Architects, Leicester	Philip Munn and Son, Architects, 6, St. Stephen's Chambers, Bristol	26
Boundstone-Twenty-two Houses for the Working Classes	Caledonian Railway Co.	G. O. Parkman, A.M.I.C.E., Engineer, Town Hall, Histon	26
Moston-Isolation Hospital	Shire's Institution Governors	W. C. Cockrill, Borough Engineer, Town Hall, Great Yarmouth	26
Glasgow-Reconstructing Buildings, Union-street	School Board	F. Baldwin, Architect, 18, Promenade-street, Abergeynny	26
Barrekerferne-Repair Cottages	Woolwich Borough Council	W. C. Cockrill, Borough Engineer, Town Hall, Great Yarmouth	26
Caister, Yarmouth-Cemetery Chapel	London County Council	James Miller, J.A., Architect, 15, Bythwood-square, Glasgow	26
Brynmarw, Wales-Hops School 420 places	King's Norton Union Guardians	The Superintendent, Carrikerrow	26
Eltham-Reception House		J. G. Cockrill, Borough Engineer, Town Hall, Great Yarmouth	26
Tostock-26 Cottages (Dwellings for Working Classes)		F. Baldwin, Architect, 18, Promenade-street, Abergeynny	26
Selly Oak-Additions to Workhouse		W. C. Cockrill, Borough Engineer, Town Hall, Great Yarmouth	26
Contra-Workhouse		The Housing Branch, Architect's Dept., 18, Pall Mall East, S.W.	26
West Incheram-Church Restoration		Whitwell and Sons, Architects, Birmingham	26
Langthill-Crosway-Classroom, &c.	Governors	Robert Williams, F.R.I.B.A., 10, Church-st., Glasgow	26
South Queensferry-Additions to Buildings for Police Station	Planning Joint Committee	Herbert Green, Architect, Norwich	26
Kirkton-in-Lindsey-Enlargement of Boys' School	School Board	P. J. Francis, Architect, Abergeynny	26
Frydenham-Addition of Flat	Oakbank Oil Co., Ltd.	G. B. Henderson, Architect, 10, Church-st., Glasgow	26
Warrburgh, Glasgow-Fifty-eight Workmen's Cottages	Standing Joint Committee	P. Palmer, Clerk, Kirkton-in-Lindsey, Lincs	26
Blackridge-Alterations to Police Station	Edwin Hetherington	P. T. Davies, Architect, Estate Offices, Howdens-rd., Heme Hill, S.E.	26
Wotton-Alterations, &c., to Romney House		The Secretary, 28, St. James-st., Glasgow	26
Wilton-West-Launder		J. G. B. Henderson, W.S., Linsidgton	26
Buxton-Cottage	Mr. Irvine	John Hutton, Architect, Kendal	26
Tringville-Casualty, &c.	Equitable Co-operative Society	Stephen Wilkinson, Architect, 10, near Chester-le-Street	26
Wigan-Stables for Forty Horses		Garrick and Flint, Architects, Buxton	26
Howle-Additions to All Saints' Schools		F. Hearn Shaylor, Architect, 10, Church-st., Oswestry	26
Crowth-Farmhouse		J. B. & W. Thornley, Architects, 10, Church-st., Oswestry	26
		John H. Davies and Sons, Architects, Newport-street, Chester	26
		Stephen Wilkinson, Architect, Pelton, near Chester-le-Street	26

BUILDINGS—continued

Willowden—Eight Shops and Fifteen Two-Storey Flats	J. R. Minnis, 25, Lonsdale-road, Barnes
Bigger—Villas	J. R. and E. E. Pearson, Architects, 27, Castle-street, Edinburgh
Penal—Additions to House	R. Hand and Brown, Architects, Harrogate
Dovercourt, near Harwich—Nine Houses	R. G. Kestin, 1, Coleridge-terrace, N.W.
Nottingham—Two Pairs of Villas, Park-avenue	Hedley J. Price, A.R.C.B.A., 24, Low-pavement, Nottingham
Two Semi-Detached Villas, Barnes-road	Garside and Pennington, Architects, W.2, Exmouth-street, Cardiff
Newcastle-on-Tyne—Additions to Co-operative Stores	T. E. Davidson, Architect, 14, Neville-street, Newcastle
Barnesley—Chimney, etc. (30ft. high)	The Barnsley Coal and By-Products Co., Ltd., Sneathies, Barnsley
Sheffield—Lauder's, 10, Beckett-terrace, Beckett Foregate	R. P. and W. Scott Design, Architects, W.2, Exmouth-street, Cardiff
Nether Broughton—Additions to Red Lion Inn	Saunders and Walker, Architects, Angel-row, Nottingham
Linfield-church, N.W.—House and Shop Premises	Richard Hall, Architect, Bangor
Dovercourt	R. G. Kestin, 1, Coleridge-terrace, N.W.
Luton—Stabling and Workshops, Manchester-street	A. Wilkinson, Architect, 81, Inkerman-street, Luton
York—St. Andrew's Church and School, 10, Monk-lane	Freddie W. Dwyer, Architect, 2, Dwyer-lane, Buildings, Manchester
Linfield-church, N.W.—House and Shop Premises	Richard Hall, Architect, Bangor
Bishop—Residence	James Young and Co., Architects, 63, Market-street, Bradford
Meltham—House	William Carter, Stationer, Meltham
Edgware—House, Canon's Park Estate	M. H. Lawson, Architect, 40, Broadway, Ealing, W.
J. Bachelior	
Jas. Kershaw	
Industrial Co-operative Society	
E. Percy and Son	
T. S. Swider	
Alfred Knighton	
Bent Ley Silk Mills	

ELECTRICAL PLAN

Daneshaster—Trolley Wire, &c.	Tramways Committee	M. McElroy, Gen. Man., Tramways Dept., 53, Fifehead, Manchester, Sept. 11
Doncaster—Tramway Poles, &c.	Corporation	C. A. L. Frusman, Bor. Elec. Eng., Greyfriars-st., Doncaster, Sept. 14
Durham—Electric Light Wiring at Market Hall and Shop	Corporation	Archibald North, S. S. Co., 8, Leeds, Sept. 14
Durham—Overhead Equipment of City Tramways	Town Council	W. H. Tittensor, City Elec. Eng., Dulhoughton Crescent-road, Dundee
Lyfard—Steam Dynamo (55-hp.) at Ladywell Sanatorium	Health Committee	C. D. Tate, Bor. Elec. Eng., Strawberry-road Elec. Works, Salford, Sept. 14
Whitehaven—Electric Lighting Committee	Electric Lighting Committee	W. F. Watts, Borough Electrical Engineer, Whitehaven, Sept. 14
Kirkcaldy—Are Lamp-Poles	Corporation	Kennedy and Jenkin, 17, Victoria-street, Westminster, S.W.
Poplar, E.—Main Extension	Borough Council	The Bor. Elec. Eng., Electrical Works, Gloucester-st., Bromley-by-Bow
Blackburn—Electric Lighting Plant	Corporation	Murray & Munk, 10, Old Glasgow, Glasgow, Sept. 14
Glasgow—Cables	Corporation	John Young, General Manager, 88, Renfield-street, Glasgow
Sheffield—Plant	Corporation	E. F. Fodden, General Manager, Commercial-street, Sheffield
Leeds—Electric Function, S.E.—Continuous-Current Plant, &c.	Public Health Council	The Engineer's, 10, Old Glasgow, Glasgow, Sept. 14
Leeds—Main Switchboard	Lighting Committee	John Young, General Manager, 88, Renfield-street, Glasgow
Greswold Tunnel—Electric Lifts, &c.	Lighting Committee	E. F. Fodden, General Manager, Commercial-street, Sheffield
Griffith—Plant	Urban District Council	The Engineer's, 10, Old Glasgow, Glasgow, Sept. 14
Blackpool—Fifty Are Lamp Cables	Corporation	Harold Dickinson, Manager, Whitehall-road, Leeds
Broompark—Electric Light Fittings	Borough Council	The Engineer's Department, County Hall, Spring Gardens, S.W.
Blackpool—Are Lamp	Urban District Council	W. H. Mountain, Town Hall, Town Hall, Leeds, Sept. 14
Blackpool—Are Lamp	Corporation	R. C. Guin, Borough Electrical Engineer, Blackpool
Blackpool—Are Lamp	Corporation	John Bradley, Clerk, Corporation, Blackpool
Blackpool—Are Lamp	Corporation	R. C. Guin, Borough Electrical Engineer, Blackpool

ENGINEERING.

Dundee—Permanent Way for Trams (93 miles)	Corporation	Lacey, Cribbrough, & Sillar, Engineers, 2, Queen Anne's-gate, S.W.	Sept. 14
Dunfermlie—Overhead Equipment of City Tramways	Town Council	W. H. Middleton, City Elec. Eng., Dundee—crossed-road, Dundee.	" 14
Dundferry—Waterworks	Urban District Council	E. Stephens, Engineer, Dundee.	" 14
Glasgow—Gas-Works and Engine, etc.	City Council	A. Bruitt, Clerk, Glasgow.	" 14
Shrewsbury—I eating Abbey Church	The Corporation	The Churchwardens, Abbey Church, Shrewsbury.	" 14
Hemel Hempstead—Sinking Well, Haize-road	Urban District Council	A. Broome, Burgess, Oak, 72, High-street, Epsom.	" 16
Milton—Electricity Works on Tramway Extension, Gas-holder	Urban District Council	J. Davidson, Manager, Gas, Milton—near-Sittingbourne.	" 16
Bournemouth—Tramway Works	Town Council	F. W. Leacy, M.I.C.E., Boro' Eng., Municipal Offices, Bournemouth.	" 16
Manchester—Steam Boiler at Mossall Hospital	Sanitary Committee	The City Surveyor, Town Hall, Manchester.	" 16
London—Municipal Water-Works	Improvement Committee	The Secretary, London County Council, London.	" 16
Chorley, Lancs.—Water Main	Rural District Council	Alban Jolly, Surveyor, 9, High-street, Chorley.	" 16
Milton—near-Sittingbourne—Marl, Acc.	Urban District Council	M. A. Farnham, Surveyor, Town Hall, Milton.	" 17
Radnor—Llanwrdaug Gas Locomotive Engines and Tenders	Urban District Council	The Secretary, Radnor Borough Council, E.C.	" 17
Ambleside—Water Main, Wellwood-street	Urban District Council	W. Gibson, Surveyor, Queen-street, Ambleside.	" 17
Eastleigh—Ventilating Free Library and Technical School	Town Council	J. Singleton Green, Roughen Surveyors, Municipal Offices, 41, Kingdon-st., Eastleigh.	" 17
St. Helier—Electricity Works on Tramway Extensions	Urban District Council	W. Harston, Surveyor, High-street, St. Helier.	" 17
Dartford—Engine, etc., Sewage Pumping Station	Urban District Council	Byth and Westland, C.E., 135, George-street, Edinburgh.	" 17
Blarney—Bridge over River Liffey	Park County Council	H. Nicholson, Engineer, 18, Upper-lane, Dublin.	" 18
Walsby—Storage Reservoir	Town Council	W. R. Copland, C.E., 146, West Regent-street, Glasgow.	" 18
Ashdon-under-Lyne—Surface Condenser	Corporation	Neville Applebee, Elec. Eng., Electricity works, Ashdon-under-Lyne.	" 18
Cardiff—Electricity Works	Frymston St., Mary R.D.C.	C. White, New Street, Cardiff.	" 18
Uxbridge—Pump, etc.	Rural District Council	J. Freeman Staro, Surveyor, 88, High-street, Uxbridge.	" 18
Oxalis—Lock-Gate, etc., (estimated cost £20,000)	Corporation	M. Thanner, Engineer-in-chief, 1, Boulton-st., Manchester.	" 19
Leeds—Watermain, Minster-gate	Gas Committee	J. Mulvaney, Paterson, Minor-work, Bradford.	" 21
Burford—Additions to Gasworks	Urban District Council	Harold Barker, Gas Engineer, Town Hall, Burford.	" 21
Burford—Service Reservoir	Urban District Council	E. J. Elford, C.E., M.I.M.E., Eng. Council Offices, New-sd., Portland.	" 21
Conventry—Electricity Works	Health Committee	Kyle and Kew, Engineers, 40, Victoria-st., Glasgow.	" 23
Bury, Lancs.—Refrigerating, etc., Plant	Health Committee	Archibald Nod, Architect, 15, Cockridge-street, Leeds.	" 23
Belfast—Sewerage System, etc.	Sanitary Committee	W. J. Barlen, Chief Engineer, City of Havana.	" 23
Bedford—Electric Lighting Pumping-Engines	Stratford and Bude Urb. Dist. Council	Frank Baker, Rev. Secy. Buildings, Middleborough.	" 23
Osteshed—Timber Staith	Health Committee	B. Latham, M.I.C.E., Parliament Mansions, Victoria-st., S.W.	" 23
Hull—Electric Lighting	General Purposes Committee	The Borough Engineer, Town Hall, Gateshead.	" 25
Conway—Water Main (70 yds.)	Rural District Council	F. J. Barnard, Chief Electrician, Municipal-works-lane, Hull.	" 25
Latterworth—Sewage Outfall, etc.	Corporation	The Borough Engineer's Office, Town Hall, Conway.	" 25
Reading—Electricity Works	British Minister of Industry	W. H. Simpson, C.E., Corridor Chambers, Market-place, Leicester.	" 26
Belcm—Docks	Borough Council	John Bowen, Chief Electrician, Municipal Buildings, Reading.	" 26
Bermansbury, R.F.—Hydraulic Flag-making Plant	Department for Public Works	The Commercial Dept. of the Foreign Office, Whitehall, S.W.	" 28
Band—Water and Drainage Works	District Committee	Fredk. Ryall, Town Clerk, Town Hall, Spa-road, S.E.	" Oct. 1
Leicester—Pumping Machinery	Corporation	Shanklin, Engineer, 10, Bedford-square, London.	" 1
London—Electricity Works on Fjord of Maringer	Danish Ministry for Public Works	James Barron, M.I.C.E., 1, Bon Accord-street, Aberdeen.	" 1
Christiansia—Turntables	Norwegian State Railways	E. G. Mawbey, M.I.C.E., Borough Engineer, Town Hall, Leicester.	" 2
Littlehampton—Pumping Plant	Urban District Council	The Commercial Department of the Foreign Office, Whitehall, S.W.	" 2
Longbeach—Electricity Works	Local District Council	H. Howard, P.S. I., Town Offices, Littlehampton.	" 3
London, S.W.—Reconstructing Tramway Routes	London County Council	L. Devonport, C.E., 2, York-st., London.	" 3
Fishguard—Extension of Rosslare Pier	Fishguard and Rosslare Railway Co.	The Engineer's Department, County Hall, Spring-garden, S.W.	" 3
London—Electricity Works	Down County Council	J. Otway, Engineer, Inchicore, Dublin.	" 19
Calcutta—Two Incinerators	Corporation	The County Surveyor, Ramnagar, Dooap-trick	" Dec. 31
Sydney, New South Wales—Harbour Bridge	New South Wales Government	Frederic Gainsford, Secretary, Calcutta.	" Feb. 28
London—Electricity Works	Municipality	The Agent-General for New South Wales, 9, Victoria-street, S.W.	" Feb. 28
Ipswich—Sinking Five Cylinders (4 ft. diam., 20 ft. deep)	Corporation	The County Surveyor, Ipswich.	" Sept. 1

FENCING AND WALLS

Blackpool - Iron Railings (1,473 lined yards)	Corporation	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool	Sept. 14
Wrexham - Wall, etc.	Town Council	J. Oswell Bury, Clerk, 9, Temple-row, Wrexham	16
Barnsley - Fence Walls	Town Council	J. Henry Taylor, M.I.C.E., Manor House, Barnsley	16
Barnsley - Walls and Concrete Wall	William Brown, District Council	William Brown, Surveyor, Howers	16
Lower Lydenham, S.E. - Wall at Home Park	Lewisham Borough Council	The Surveyor, Town Hall, Catford	26
Lewisham, S.E. - Iron Fencing	Borough Council	The Surveyor, Town Hall, Catford	26
Forbes -	Urban District Council	W. G. W. Roberts, Surveyor, Police Rooms, Forbes	30
Pontefract - Wrought-Iron Fencing (70ft.)		A. Odby, Borough Surveyor, Pontefract	

FURNITURE AND FITTINGS

Crydon—Furniture, &c., for Children's Home	H. List, Clerk, Union Offices, Mayday-road, Thornton Heath	Sept. 16
Enya, Essex—Furniture, &c., for Cottage Homes	W. Vallance, Clerk, Whitechapel Union Offices, Vallance-rd., N.E.	" 17
Dartford—Kitchen Fittings, Joyce Green Hospital	A. and C. Harston, Architects, 15, Leadenhall-street, E.C.	" 23
	Metropolitan Asylums Board	

PAINTING.

Kendal - Abbey House	Guarlands	A. Mide, Clerk, Lower-street, Kendal		Sept.
Pennine - Workhouse	Gow's Union Guardians..	H. J. Ind, Clerk, Victoria Chambers, Oxford-street, Swansea		" 16
Raunds - Workshops	Bee'low Union Guardians..	Robert J. McEath, M.P., The Grange, Hove, Sile, Knaresford		" 18
Bristol - Exterior Portion of Property	The City Valuer, Council Office, Bristol	The City Valuer, Council Office, Bristol		" 19
Dagenham - Small-pox Hospital	West Ham Corporation	The Borough Engineer's Office, West Ham, West Ham, E.		" 24
Dunkinfield - I'tanahan School-Chapel, Richmond-street	J. W. Ashton, Chapel-street, Dunkinfield			
Barrow-in-Furness - Temperance Hall, Green-gate-street	G. Nichols, 33, Marsh-street, Barrow			

ROADS AND STREETS:

Springfield—Making-up Navigation-road and Queen's-road	Che'nsford Rural District Council	H. Glyn Warren, Surveyor, Avenue Chambers, Chelmsford	Sept. 14
Hulifax—Former Main-street		W. Clement Williams, Architect, 29, Southgate, Halifax	" 14
Lockport—on Whiting's Road	Rural District Council	J. R. Wilson, A.M.I.C.E., Port Colomendy, Colchester	" 14
Wolverhampton—St. Andrew's Works	Streets Committee	See Borough Engineer's Office, Town Hall, Wolverhampton	" 14
Blackburn—Paving Streets and Back Roads	Highways Committee	W. Stubbs, A.M.I.C.E., Boro' Eng., Municipal Offices, Blackburn.	" 16

ROADS AND STREETS.—continued.

Hanwell, W.—Street Works	Urban District Council	S. W. Barnes, Surveyor, Church-road West, Hanwell.	Sept. 16
Salford—Paving and Completing Streets	Urban District Council	L. C. Evans, Town Clerk, Town Hall, Salford.	17
London, E.C.—Asphalt Paving Works	Urban District Council	The Public Health Department, Guildhall, E.C.	17
Amble—Making-up Gravel-Street	Urban District Council	W. Gibson, Surveyor, 34, Ambrose-road, Amble.	17
Kilburn, N.W.—Wood-paving 3,324 yards. Cambridge-road.	Wildesden District Council	O. Claude Robson, M.I.C.E., Drme-road, Kilburn, N.W.	17
South Newwood—Repairing Whiteboards-road	Croydon Town Council	The Borough Road Engineer's Office, Town Hall, Croydon.	17
London, E.C.—Wood Paving Curriavays	The Public Health Department, Guildhall, E.C.	The Public Health Department, Guildhall, E.C.	17
Tynesmouth, Tynning, &c., Llandisfard and Belford-terrace.	Corporation	John P. Small, Borough Surveyor, North Shields.	17
Deptonford, S.E.—Paving Footways, Sandford and Whitelock-st.	Borough Council	Vivian Orchard, Town Clerk, 25, Tanner's Hill, Deptford, S.E.	17
Widened—Maidenhead Road	Urban District Council	C. H. Cooper, M.I.C.E., 10, West Street, Maidenhead.	17
Cherwell, W.—Making-up Barngate and Flaxway-roads	Urban District Council	Arthur Ramsden, Surveyor, Town Hall, Cherwell.	18
Newmarket-on-Tyne—Wood Paving Central Station	North-Eastern Railway Co.	Charles A. Harrison, Central Station, Newcastle-on-Tyne.	18
Pole—Maidenhead Road	Town Council	John Eilford, Borough Surveyor, 10, West Street, Pole.	18
Lewes—Making-up Roads	Town Council	The Borough Surveyor's Office, Town Hall, Lewes.	20
Rugby—New Road, Castle Field	Corporation	Fred. T. Clayton, Borough Surveyor, Market Hall, Rugby.	23
Kings-on-upon-Thames, Dan and Hagging Old Mill-Lane.	Urban District Council	The Borough Surveyor, Clutton House, Kings-on-upon-Thames.	23
Tottenham—Making-up Three Roads	Urban District Council	W. B. Prescott, A.M.I.C.E., Engineer, 712, High-road, Tottenham.	24
Moffat—Alteration of Roadway, &c.	Joint Bridge Committee	Wm. Park, Town Clerk, Moffat.	24
Littleham—Korling, Channing Lane, &c., St. Ann's-road	Urban District Council	W. H. Prescott, A.M.I.C.E., Engineer, 712, High-road, Tottenham.	24
West Ham, E.—Making-up Streets	Corporation	The Borough Engineer's Office, Town Hall, West Ham, E.	24
Middleburgh—Paving Carriavays 21,000 square yards	Streets Committee	T. Baker, J.C., F.G.S., 89, St. Mary's, Middleburgh.	24
Nissen Hill—New Road	Urban District Council	Vigors and Co., A. Frederick's-place, Old Jerry, E.C.	27
Wham—Stone Paving at Chipping Hill	Urban District Council	W. P. Perkins, Surveyor, Wham.	28
Eudal—Victoria Stone Paving, &c.	Middlesex County Council	Henry T. Wakeham, County Engineer, Guildhall, Westminster.	Oct. 1
Skipton—Kerbing, &c.	Urban District Council	W. H. Hutchinson, Holme Cottage, Embay, Skipton.	1

SANITARY.

Tidbury—Sewer, &c.	Rural District Council	H. G. Keywood, Engineer, Public Hall Chambers, Maldon.	Sept. 14
Gloucester—Sanitary Convenience at Cemetery	Urban District Council	The City Surveyor's Office, Guildhall, Gloucester.	14
Dulry—Sewage Disposal Works	Ayrshire County Council	James Barr, C.E., 221, West George-street, Glasgow.	16
Great Waltham—Sewer, &c.	Chelmsford Rural District Council	James Dewhurst, Eng. Avenue Chambers, Market-st., Chelmsford.	16
Leithbury, E.C.—Alterations to Underground Convenience	Corporation	The Town Clerk, Public Health Department, Guildhall.	17
Mitholmyn—Main Drainage Works	Urban District Council	Sam Shaw, M.I.C.E., Church-street Chambers, Dewsbury.	17
Colington—Sewer, &c.	Urban District Council	Samuel Knight, Clerk, Council Offices, Bollington.	17
Forest Gate, E.—Underground Convenience, Sebert-road	West Ham Corporation	The Borough Engineer's Office, Town Hall, West Ham, E.	24
Hallaton—Sewage Works	Rural District Council	Cole & Johnson, Engineers, Bank Chambers, Market Harborough.	24
Bromley—Sewers, &c.	Urban District Council	Walter J. Lomas, Engineer, 11, Pall-mall, Bolton.	24
Hale—Sewers, &c.	Urban District Council	Frank J. Lobley, A.M.I.C.E., Albert-road, Hale, Cheshire.	30
Bradford-on-Avon—Sewers	Urban District Council	H. Hanson, Surveyor, Town Hall, Bradford-on-Avon.	Oct. 1
Baldford—Sewer, &c.	Corporation	B. Latham, M.I.C.E., Parliament Mansions, Victoria-street, S.W.	1
Erith—Low and High Level Sewers.	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	1

STEEL AND IRON.

Wrought—Cast-Iron Pipes, 750 tons	Corporation	James M. Gale, Water Engineer, 45, Jobe-street, Glasgow.	Sept. 14
Bournemouth—Steel Grooved Girder Rails, &c.	Town Council	F. W. Lacey, M.I.C.E., Barr Eng. Man. Offices, Bournemouth.	16
London, E.C.—Wrought-Iron Bars, Plates, &c.	Burma Railways Co.	The Secretary, 74, Gresham House, Old Broad-street, E.C.	17
London, S.W.—Steel Axles and Tires	Southern Mahratta Railway Co.	The Secretary, 46, Queen Anne's-gate, Westminster, S.W.	17
Selly Oak—Fire-Escape Masts at Workhouse	King's Norton Urban Guardians	Thwaitell and Son, Architects, 11, Pall-mall, S.W.	17
London, E.C.—Wheels and Axles	Burma Railways Co.	The Secretary, 74, Gresham House, Old Broad-street, E.C.	17
London, E.C.—Fishplates, &c.	Central India Railway Co.	T. W. Wood, Sec., Gloucester House, Bishopsgate without, E.C.	18
Amsterdam—Asphalted Cast-Iron Pipes 3,075 tons	Netherlands Ministry Colonies	The Commercial Department of the Foreign Office, Whitehall, S.W.	18
London, S.W.—Cast-Iron Piping	Uganda Railway Committee	The Crown Agents for the Colonies, Downing-street, S.W.	19
London, S.W.—Galvanised Wrought-Iron Piping	Uganda Railway Committee	The Crown Agents for the Colonies, Downing-street, S.W.	19
London, W.C.—Steel Trussway Rails 3,000 tons	British Electric Traction Co.	The Engineer, Doughton House, Norfolk-street, W.C.	21
Buxton—Cast-Iron Mains and Specials	Gas Committee	Harold Barker, Gas Engineer, Town Hall, Buxton.	21
Lincoln—Steel Tranchers, firders, &c. 960 tons	London County Council	Rushton, Froctor, and Co., Sheet Ironworks, Lincoln.	21
London, S.W.—Notch Rails, &c.	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	Oct. 8
London, S.W.—Track Rails, &c.	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	8

STORES.

Fleetwood—Broken Stone	Urban District Council	Joseph Tildesley, Clerk, Town Hall, Fleetwood.	Sept. 14
Charley, Lancs.—Road Materials (One Year)	Corporation	William Leigh, Borough Surveyor, Town Hall, Charley.	16
Manchester—Concrete Tubes, &c.	Rivers Committee	The Secretary, Rivers Department, Town Hall, Manchester.	16
Sunbury-on-Thames—Kerbing Brown Pitt Plinths 1,000 yd.	Urban District Council	Harold F. Coates, Surveyor, Sunbury-on-Thames.	16
Atterton—Sewer Pipes	Joint Sewerage Board	D. Schofield, Clerk, Town Hall, Atterton.	18
Leeds—Lime 900 tons at Knotsford Sewage Works	City Council	The City Engineer's Office, Leeds.	18
Brendford—Miscellaneous Goods (One Year)	St. Evers, Town Clerk, New Hall, Bradford.	St. Evers, Town Clerk, New Hall, Bradford.	18
Earlston—Road Material (One Year)	C. Cole, Clerk, Town Hall, Earlston.	C. Cole, Clerk, Town Hall, Earlston.	20
Guildford—Blue Guanoes (Granite 1,000 tons)	City Council	C. O. Moon, C.E., Borough Surveyor, Tynsgate, Guildford.	20
London, E.C.—Various Goods	Gr. Indian Peninsula Ry. Co.	D. J. Berry, Secretary, Copthall House, Copthall, S.W.	20
Histon Norris—Granite Setts 100 tons	Urban District Council	Wm. Hodson, Clerk, Heaton Moor, Stockport.	20
London, E.C.—Telegraph Poles	Postmaster-General	C. E. Stuart, Controller of Stores, General Post Office, E.C.	20
London, S.W.—Lime 22,800 tons, at Outfall Works	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	Oct. 8
London, S.W.—Protosulphate of Iron (3,800 tons)	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	8

CHIPS.

The city council of Liverpool at their last meeting adopted by a large majority a recommendation to place £219,000 at the disposal of the tramways committee.

A new infants' school, which has been erected by the managers of the Hales Owen British Schools upon land adjoining the old school, was opened by the Lord Mayor of Birmingham on Friday. The cost of the extension has been £1,500, and additional accommodation will be found for 250 infants, bringing the total accommodation up to 600 children.

A new isolation hospital is about to be built at Sevenoaks from plans by Mr. W. I. Ansell.

The partnership heretofore subsisting between F. Penfold, F. Lewis, and F. D. Hayward, civil engineers, architects, and surveyors, Victoria-street, Westminster, S.W., under the style of Penfold, Willams, Lewis, and Co., has been dissolved.

At the last meeting of the Mitford and Llandudno Board of Guardians a series of resolutions approving of the plans for the alterations of the workhouse, and asking the council to borrow £3,550 to meet the cost, was agreed to.

Two new bells which have been added to the peal in the tower of St. Albans Cathedral were formally dedicated by the Dean last week.

The corporation of Tunbridge Wells have elected Mr. W. W. Crane, of Hastings, as building inspector, at a salary of £110 a year, rising to £150.

The Great Northern Railway Company's Leen Valley extension, joining the company's railway at Langwith, has been completed and opened for mineral traffic. The Calow and Boud's Main Joint line and the Leen Valley extension have been opened for traffic, also under the auspices of the Great Northern Company.

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FRIDAY, SEPTEMBER 20, 1901.

THE ARCHITECT OR SPECIALIST.

ONE of the many questions discussed at the late Convention of the Architectural League of America was the relation of design to construction, or "Should design and construction be separated so as to train specialists on each of these lines?" There have always been those who have contended for separation. The early Revivalists certainly laid stress on design as the principal function of the architect, and exponents of architecture at various times have intimated that the architect should confine his attention to the designing of buildings, leaving to the builder and engineer points of construction, especially in those buildings where any special construction was called for, such as a roof of any size, or any ironwork. Nor has it been thought at all irregular for an architect entrusted with any great work to call in an engineering expert to design and carry out certain parts of the building about which the architect knew little. Eminent men like Barry and Scott consulted engineers in the preparation of parts of their designs, and the roofs of the Houses of Parliament and St. Pancras railway station were both designed by engineers; indeed, leading members of the profession to-day do not scruple to employ experts to assist them in important works. Nearly all these men would be the last to admit that design and construction are distinct and independent, or that they should be practised by two different classes. They have employed engineers to assist them in questions of exigency or necessity, and to save time and labour, not because they considered the work foreign to the duty of the architect. It is often more convenient to employ a specialist. The general medical practitioner delegates to a specialist the duty of prescribing in certain cases, performing special surgical operations; and the lawyer considers the particular branch of medicine or surgery a distinct profession, but that a man practising in one branch must be more skilful. And it is precisely for the same reason the architect engaged in a general practice may occasionally call in the engineer or expert in steel to assist him. Nevertheless, there are a few men in the profession who believe that it would be advisable to place all constructive matters and details in the hands of engineers or experts, as there are many who think an architect should never trouble about quantities or any matter of valuation, as not within his province. These advocates of sub-division of labour believe that by training a man in one groove of practice he acquires such expertness as to become beneficial both to himself and his employer, though this view of the practice, as we shall endeavour to prove, is only a partial one; the man of one groove becomes a machine and his work soulless. They also appear to think it not necessary that he should learn his art as a whole, but only that particular branch of it that he desires to follow: the consequence of which is that the specialist in one line, say, iron or steel construction, is never properly grounded in the elements of architecture, and his conceptions and details are often utterly at variance with those of the all-round architect. He might pass muster in design for market-sheds or a railway station; but his design for, say, a concert-room or winter-garden, or even a pier, would be sure to shock the trained architect. A specialist in a branch of architecture, say, hospitals, unless he had also "cut his teeth" on the other branches of building, would be likely to produce very unsatisfactory designs.

Instances of specialists' architecture may be seen in many of the buildings erected for workhouses, infirmaries, police-stations, barracks, prisons, and other structures which are usually designed by the officials of departments, who devote themselves exclusively to these branches. We concede to these officials considerable skill in plan and knowledge of the regulations in many of them one sees the education of the architect who has turned his special attention to one class of practice. But if the official architects of the Local Government Board or the War and Home Offices were to be trained for their special work, exclusive of a general knowledge of architecture, we should expect to find much less satisfactory results. Yet it is this exclusive training that is advocated by the school of architectural separatists, if we may so call them, who would confine the instruction of the architectural student to that branch which he preferred to follow, who would instruct and train some to design furniture or metalwork, others churches, schools, or hospitals, others to become decorative designers, and so on. It is against this exclusive study of one branch that we certainly protest, as it would make a number of human machines or narrow-minded experts. Speaking of specialism in science at the British Association the other day, Major MacMahon referred to the term "specialist" as "a term of opprobrium, or as a symbol of narrow-mindedness." He was declared to be a man "who ran after truth in intellectual blinkers; who wilfully restrained himself from observing the work of others, and aimed at absolute independence as the one thing to be desired." This fairly describes the specialist in art; he is blind to all other qualifications but his own, unheeding of what others have accomplished; he despises all art qualifications if it happens to be a practical man. In his rejection of all traditional forms of art, he becomes a slave to his own personal whims and narrowed views.

The question raised may be considered in various ways. Is it possible to separate design from construction? According to the latter class of teachers—those we have called "separatists"—it may be. They regard design as something quite distinct from construction, as the exercise of the imagination on paper, in fact, drawing applied to building or decoration; a branch that can be cultivated quite apart from the processes of construction. According to this view, the architectural draughtsman is a designer of buildings, and whatever he may express on paper, so long as it is controlled by certain rules or prescriptions of art, is independent of materials and workmanship, and is a pursuit of its own. The man who designs an impossible piece of construction, such as a cornice or a detail for stone that can only be made in plaster, is still a designer in this sense, for his art is not subject to any limitations, a view quite contrary to that held by all architects in the honest sense. In fact, the right term to apply to such design is that applied by Pugin—"constructed decoration": that is, the design must be carried out, however faulty it may be as a piece of construction. Thus such a building as the Pavilion at Brighton is a design in this sense: all the bulb-domes, minarets, and other details have been made to imitate those forms in stone, plaster, or wood, instead of being designed to suit stable principles of construction as applied to the materials used. So with many of the early Classic and Gothic buildings of the Revival. They were designed to effect in complete disregard of honest construction, as in the plastered groined vault and meaningless buttresses and arches. Their builders were chiefly engaged in constructing design instead of designing construction, thus putting the cart before the horse; in other words, trying to adapt constructive expedients to design. Or the ques-

tion may be put in another way. Can construction be studied apart from design?—which is the usual constructor's way of looking at it. The ordinary specialist in engineering construction asserts that it can. He does not trouble about design, but he adapts his materials in the roughest manner; he is represented by the practical rule-of-thumb engineer. We know his work when we see it—cumbersome, or excessively agile, without proportion or good detail. Yet it is possible to construct in a manner without any forethought or study of the relation of part to part, whereas it is not so easy to design without knowing how to construct. There can be no good construction apart from thought and arrangement, which imply design. But of the two it is more logical to place construction before design, as this is the natural order.

To return to the original question, "Should design and construction be separated so as to train specialists in each of these lines?" The answer given by the Toronto Architectural Eighteen Club goes to the root of the matter and distinguishes between the two sorts of specialism we have described. They say these departments should not be separated, "because a specialist is one who, in addition to the ordinary knowledge of his craft, acquires a special knowledge of one line—not one who has acquired a knowledge of one line only of the general knowledge of his craft." We have already shown the undesirability of becoming a specialist in the latter sense. It is easy to apply this dictum to any of the crafts employed in building as well as to the profession of architecture. The practice in this country at least is to ground the pupil: to instruct him in the general elements of his art, and then to apply his talents in that direction which he desires to follow. A young man apprenticed, say, to the trade of a carpenter or joiner, is first taught the use of his tools, how to set out framing of various kinds, how to put together roofs as well as to frame a door, or make a window; but he ultimately is put to one line of work for which he is more capable, say door-framing or staircase work. In this class of work he becomes proficient, and obtains higher wages. So in the other trades. The master man discovers his fitness or bent for any particular line. Professor White, of Illinois University, speaking from experience, says both design and construction should receive equal consideration in a college training, for rarely is a student capable of selecting his speciality;—others estimate his strong points sooner than he can. Being equally trained in both branches, he can more easily determine the line of work he is best adapted for. A special knowledge of one line can only be acquired properly after other lines have been studied up to a certain point: a question that leads to further considerations of the architect's work. Thus it is obvious that a specialist in any branch of construction must know something of the other branches. He must know the usual ways of designing buildings for various uses, something of their style and treatment, before he can adapt his construction to various purposes. The expert in steel construction must know how he can apply his work to any particular purpose, such as a tier or gallery of a theatre, to the construction of a dome or roof. He may follow the architect's design generally, but he has constantly to exercise his ingenuity in arranging his materials to meet points and to suggest other methods than the design indicates if his services have to be of any value. A general knowledge of ruling types must be learned before the specialist in hospitals can decide upon any principle to guide him in his designs. It would be impossible for the architect who takes up one line to close his eyes to all others—to wilfully blinker them; for such a course would so narrow his range of design that his work would have little save mechanical qualities to commend it.

We often see buildings spoiled by the introduction of external revolving ventilators of poor design, by some mechanical excrescence on the roof; theatre specialists frequently mar the design by an excessive height of stage, or by an external arrangement of corridors that offends the eye; those who design breweries often mar the building by a total disregard of architectural proprieties; and many other examples may be met with of the same strange independence. Many of our monstrosities and excrescences in building go under the name of specialism. If a scientific deduction or improvement leads to a departure from all existing models, let it at least be put in the hands of men who have studied their profession as a whole, and who are more likely to bring it within the restraints of art and good taste. The specialist, with a love of eccentricity to boot, is a misfortune, though he is not much worse than a specialist who has studied nothing but his own particular line, and is determined to emphasise it. Draughtsmanship, no doubt, inclines to specialism of a certain sort; thus we have those who have given themselves up to decoration, to furniture-modelling, metalwork, and stained glass. Even amongst these designers of accessories to architecture, exclusive specialism can be carried too far, for we all know men enthusiasts in their particular branch, who pay little regard to architecture. Notice the architectural sculptor, the carver, or the decorator, how they both extend the limits imposed by architecture, how seldom they are restrained. The corrective to this is a knowledge of construction or the crafts.

The point raised has a bearing on another question. Is a knowledge of a variety of branches desirable? Of course, this is a question that can only be answered by each individual. There are men who cannot master more than one subject perfectly, one is quite justified in expending his study and labour in his particular sphere, and men who can master several subjects. We know men who are experts at mathematical analysis, who study successfully all constructive problems, and who devote their time in writing treatises on them; but a very few only of these ever attain to any proficiency in design—many have no idea of it. Others there are who are splendid designers who cannot solve the simplest equation, and yet who can turn their attention to many branches of art. What is architectural design? Is it a matter of employing certain materials, and what are these? This is a question that has not been considered as it ought to be. We candidly admit that stone, brick, timber, iron, plaster, and a few other materials form the basis of such design; but time changes. In the future it may be steel or some other material that we shall have to build with. Will this be architectural design, or will it be engineering? Is architectural design, in other words, limited to certain materials? Certainly not; it has generally been associated with the materials we have named, and the rules formulated have been based on these; but it does not follow that these will last for ever. New materials may arise requiring other principles and rules, and the designer must be able to formulate these, if design implies beautiful construction. One answer to this is: "We do not know what the material of the future may be; there may be no stone or wood. Times change, and we must change with them. If to build with steel construction is engineering only, then to cover this construction with an architecturally ornamental plaster is decoration only." The conclusion is obvious. We must not base our design for new materials like steel on principles derived from stone or wood; in fact, architectural design is not limited to the materials used in the past, but must be evolved from any materials that may be introduced for constructive purposes. The architect must seize his opportunity at the

earliest possible moment, if artistic perception is to be applied. He should be able to apply his knowledge to every material that comes into use, and it is this power that places him above the mere specialist. As a master of all the crafts of building, he should be in the position of one who can take a wide view of the possibilities of design. The specialist who devotes his attention to one line or material is unable to do more than to take a partial view of the case. He is either a constructor or a decorator. The bane of modern architecture has been that its professors have assumed certain principles, based on material like stone, brick, and wood. Upon these architectural design has been practised. When any new material offered itself like iron or steel, the engineering specialist has been the first to avail himself of the new conditions, and hence he has taken from the profession all structures in which iron and steel have been employed, amongst them bridges, construction, railway edifices, large roofs of buildings. It has been observed truly the architect is the opposite of a specialist. He is supposed to be able to design in any material, and for this reason he should make himself a master of its various properties. But the exigencies of modern practice involve the use of specialists, as we have hinted just now. They are auxiliaries in all large buildings, they expedite the work of the architect; but they must only be looked upon as expedites. To attempt to train them in their own particular branch only would be to disintegrate the profession, and to introduce a number of men incompetent as architects to deal with the many problems of design.

Probably the comprehensiveness of the courses now given to students, including, as they do, so many different studies, may have something to do with the separation of design from construction. Thus the course given to students by the Architectural Association is very comprehensive, and may have the effect of inducing young men to shirk their labours. The architect of half a century ago was not required to know a tenth part of the course now presented to the student. At least, it is a question whether so formidable an array of subjects now put forth by colleges in America and in England will not have a deterrent influence by driving youths out of the profession or by inducing them to take up special lines of study. This comprehensiveness of the courses, by encouraging cramming, must be injurious, and tend to a superficiality of knowledge that is decidedly objectionable, for it must not be supposed that the average student is capable of acquiring or profitably retaining half the subjects that are put down in the courses. The result must be that many students will take up one or more subjects to the exclusion of others perhaps equally important. We cannot cram a brain with a superfluity of matter without disturbing the mental digestion.

REBUILDING ON NEW SITES: THE FLAT SYSTEM.

A FORECAST of any new scheme of building operations is often disappointing in the result, so much depending on the style and completeness of the design, on individual requirements and execution. One of the finest sites ever opened for rebuilding is that now partially cleared of old houses from Wellington-street to St. Clement Dames in connection with the new extension of the Strand to Holborn. It has a noble frontage of several hundred feet facing a broad thoroughfare. A design has been prepared by Mr. Runtz, and will soon be put into execution for the Gaiety Theatre, offices of the *Morning Post*, and restaurant at the western end of this site, of which we published the design on Aug. 23, p. 244, but a considerable frontage is still left to the imagination.

No design, as far as we know, has been decided upon for this remaining portion of the frontage. We may presume, at least, that the keynotes of the future frontage will be "Classic or Renaissance in some form, so as not to clash harshly with the Strand front of Somerset House and the Church of St. Mary, and that a general scheme of facade will be adopted that will be worthy of the situation. Beyond these conjectures we know very little. If an important part of the frontage is to be retained for a public official edifice like that contemplated in the instructions in the recent competition, a good commencement will be made, and a central building of value erected where it is most needed. But will personal or commercial considerations stand in the way of the fulfilment of a uniform design? Has any decision been arrived at about the kind of buildings to be erected eastwards? Mr. R. Norman Shaw, R. S., as we have said, is the London County Council, will, we may be sure, that no unsightly building is erected, and that the ideas expressed in the recent competitive designs will be kept in view, if not closely followed. The views we published will give the reader an idea of the western end of the crescent, and we believe that Mr. Walter Emden has prepared a design for Carr's Restaurant at the eastern end near the Law Courts. Had the general elevation submitted by Mr. Runtz in the competition been accepted as a whole, we should have a conspicuous central edifice adorned by a wide portico, and flanked by curved wings, receding from the Strand frontage, and terminated at the ends by lofty campaniles or towers with domical summits at the corners of the cross streets into the crescent behind, the whole centre forming an isolated block of imposing extent and elevation. We refer our readers to the view we gave of this portion of the design on Aug. 30. What kind of buildings will be erected on the site as a whole? Will they be shops, commercial or private business premises? On these questions the character of the architecture will mainly depend. The shop-front element would not, at any rate, be in accordance with any of the designs submitted by the architects invited; it would not be in harmony with the buildings of a public kind that are to be erected, or which exist in the Strand, though it would no doubt be more profitable. A dignified and palatial class of buildings cannot be built over a row of shops, however carefully they may be designed, simply because the solid basement so necessary for a monumental facade is wanting. One design we favourably noticed showed a monumental facade towards the Strand, well broken up into blocks, and treated sculpturally in its details; there was also a dignified centre set back from the main front. Perhaps such a treatment will be considered too severe, and a facade of a semi-public character formed of offices and blocks of flats will be deemed more desirable. And there is something to be said in favour of superior shops, if the traditions of the Strand are to be preserved. At least in the crescent behind, on the north side, the whole would be probably let as shops, with offices or flats above.

We believe there is much to be done in improving the "flat" system in London, which seems now to be only on its trial, but which in the future will be more developed than the conservative Englishman imagines, whatever his proclivities for having a house of his own. The London "flat" is by no means a satisfactory thing, for it has not received the attention or encouragement of dwellers or business men in the Metropolis. The examples we have of it in the West End, St. James's-square, and such neighbourhood as Clapham, Battersea Park, and other South London suburbs, are certainly disappointing; they are monotonous and depressing externally, the entrances are poor

and the staircases narrow or dark. In Paris, as we all know, it is the most usual class of dwelling, and quite two-thirds of the residential portions of the French capital consist of flats, or the private hotel or *maison particulière* for the wealthier citizen. For this reason the problem has been thoroughly studied in all its details;—the entrances are wide and inviting, often a *porte-cochère* which is open at an early hour, and which remains open till a late hour. There is the *cucinière* to look after the conveniences of the tenants. Within the main entrance is a courtyard, a clean and attractive feature in many of these buildings, designed for stables, &c. There is a wide staircase to every two flats, which perhaps open on each landing. Often there are four to a dozen staircases, according to the size of the block. These are wide and handsome, and well lighted by courts, not like the cramped stairs we find in many of the London flats; and the fatigue of mounting is minimised by a proper proportion of tread to rise. There is also a servants' staircase. Then the staircases are handsomely covered by carpets. The grand apartment consists of a spacious hall or an ante-chamber, a dining-room, one or more salons, three or four bedrooms, and the kitchen offices and servants' bedroom on the upper floor, with cellars in the basement. Take, for example, the flat in the Rue Danton; it is triangular in the shape of its plan. The suite of rooms along the thoroughfare which is the longest side of triangle, contain a *salle à manger* of about 14 ft. square, opening into a smoking-room or *fumoir*, an angle-room, and a *salon* of about the same size on the other side; a landing, octagonal staircase, and back stairs adjoining, a *grande chambre* and two others, *toilette* room, and other conveniences, and behind, near the back staircase, is the *cuisine*. The staircases are lighted by courts on both sides. Each of the front rooms has a flat bay-window. We have described the first, second, and third floors. The ground floor is occupied by two large *boutiques* or shops, with entrance, *loge*, rooms for *camière*, and the staircases. These shops have externally arched windows, a bold transom dividing the lower part of the front windows from the semi-circular heads. The bays are cleverly corbelled out over the shop entrances, and the angle forms an octagonal turret, also corbelled over the shop windows. We have taken this example as a good one for a plan of flats with shops below that would be well adapted for the new crescent. Other modern flats of a more private residential character have been designed in the Rue Chateaubaud, by Mous-M. G. Rives. Some of the flats are constructed entirely of *béton*, or the Hennebique system, which we have described. We have seen mansions in London on the flat system that will compete with several recently built in Paris. In the Champs-Élysées many blocks of flats, furnished—or, as it is called, the *appartement meublé*—have been built, and are let on short terms, and the decoration and furniture are in good taste. In the new site facing the Strand a grand opportunity will be offered for blocks of flats on this system that would be highly remunerative. The block of flats can be treated with the dignity. If shops are provided below, they can be divided by *ma-sive* piers and a transomed arrangement of windows, as shown by a few of the designs we illustrated. These blocks may also be designed with a degree of breadth and to a scale that would make an imposing facade; part of the latter could be recessed and have balconies, and the blocks themselves would form larger units than the ordinary shop or dwelling-house with small frontage. When the Council have considered the requirements of such a central position for flats, or not, we think the site admirably fitted for a class of building that would offer a largeness of treatment and scale befitting an important elevation. To

the architects who submitted designs for the Strand improvement nothing very difficult as to the class of buildings was supplied, except "that the buildings to be erected may be intended for commercial purposes; but the architects, in preparing their designs, shall have regard to the possibility of the central portion of the site lying between the new crescent road and the Strand being used for the erection of a public building." Other sites in the new avenue itself and elsewhere might be usefully occupied by blocks of flats of a less expensive kind. There are few models in London for flats of a middle-class character; those that have been built are something between model-dwellings and business premises. The approaches from the street are insignificant and narrow by the side of shops, the landings on each floor to two or more suites of rooms are absurdly small, the areas for light and air are, if provided, very contracted and inadequate for the purpose, the living-rooms are often small, and the conveniences cramped and ill-ventilated. The aim of the architect in these residential buildings has been to provide good-sized shops that can be readily let, and the upper floors have been sacrificed to these. Nothing has been attempted in the way of decoration; the halls and staircases are generally of brick, with tiled floors; the steps are of concrete, concrete, or stone, or carpeted. Externally these middle-class flat dwellings leave much to be desired; many of them have flat fronts pierced by ordinary windows, devoid of any decoration. At Brixton several flats have been built that may be mistaken for improved dwellings for the working classes; the stories are repeats of the same design, and the entrances very small. Architectural effect has not been the aim of speculators in this direction. Even residential flats of a superior kind, like those recently erected in King-street, St. James's, are very plain, the main effect being that obtained by large bay windows. These are built of white brick and stone in the mullions and dressings, and with some attempt in the angle bay. Plain bare building of this class is doubtful economy. Tenants for this kind of dwellings look for a little attractiveness. It is bad enough to have to occupy a suite of rooms—perhaps a sitting and bedroom—in an upper floor sandwiched between other tenants, and the least the tenant desires is convenience, an easy ascent to his rooms, and an attractive exterior that will not remind the visitor of a barracks or blocks of working men's dwellings. The architect has here an opportunity, if he will, but take advantage of it. The Parisian model flat is before him and the modern hotel. Why cannot the residential flat, which may be built to pay a good rental, be equally tasteful and decorative, both internally and externally, without extravagance, instead of being exceeding dull and commonplace? A block of flats at a fair rental in our best streets would yield a handsome return much greater than ordinary houses built on the same plot. Flats in London let from, say, £50 to £200 or £300 each in good localities—a remunerative rental for a block of several stories. Although a block occupies a larger area of ground than an average house, the horizontal division into floors is more profitable than vertical division by party-walls; the walls and partitions are mainly repeats of each floor, the chief expense being in the floor construction and fittings, sanitary and electric. The subject is one that will bear threshing out in detail. In the denser and compact parts of London, the system of flat dwellings is becoming almost a necessity in the economy of space, if for no other reason. There are thousands of City men and clerks who would be willing to live in a comfortable self-contained suite of apartments on this system, even if they paid a little higher rental, than for a small house in the suburbs; but it is not necessary now

to enter into the question of economy. While London continues to extend yearly its boundaries, it becomes more and more a physical impossibility, even with tube railways, and motor-cars, and bicycles, to reside so far from the place of business. There must be a limit sooner or later to the possibilities of physical exertion, and this can only be met by providing dwellings or a large proportion of dwellings in suitable positions within the boundaries of the City or the Metropolis. Unfortunately, it is becoming less a question of desirability than of expediency.

THE BRITISH ASSOCIATION AT GLASGOW.

THE annual meeting of the British Association, which has this year been held at Glasgow, was opened on Wednesday evening in last week by an address from the President, Mr. A. W. Tucker, F.R.S.E., of London University, who, in place of discussing the progress made in some branch of scientific knowledge during a given number of years, as has been the custom of most recent occupants of the chair, set himself to explain in what direction the theories on which modern deductions are based are capable of challenge. He vigorously upheld the Atomic theory as the only speculation which harmonised the diverse phenomena of diffusion, expansion, and heat. In opening Section C, that of Geology, on Friday, Mr. John Horne, F.R.S., dealt with recent advances in Scottish geology, and Dr. H. R. Mill, in Section E, Geography, delivered a presidential address in which he discussed the question of the material for a complete geographical description of the British Isles, and announced that the bathymetrical survey of all fresh-water lakes in the United Kingdom would be completed by the private enterprise of Mr. Laurence Pullar and Sir John Murray.

RECENT EXPLORATIONS IN CRETE.

Mr. J. L. Myres, the secretary of the Cretan Exploration Fund, formed in 1899, read before Section H, that of Anthropology, the report of the committee. The excavations began by Mr. Arthur Evans in 1900 at Knossos, and continued during the present year, had brought to light an ancient palace of vast extent, which there was every reason to identify with the traditional house of Minos, and at the same time with the legendary "Labyrinth." And apart from the architectural results, the finds within the walls of the palace had been of such a nature as to throw an entirely new light on the art and culture of pre-historic Greece. Beneath the palace itself and the adjoining houses a very extensive Neolithic settlement had been explored. In the lower town of Knossos Mr. D. G. Hogarth, the late director of the British School at Athens, had excavated a series of pre-historic houses, in which he had found many remarkable painted vases, showing that a highly-developed ceramic art flourished there already before the days of the civilisation known as Mycenaean. Mr. R. C. Bosanquet, the present director of the British School, had carried out an exploration on the site of Prasos, in the east of Crete. And this season Mr. Hogarth had been enabled to explore an ancient site at Zakro, also in the east of Crete. Mr. R. C. Bosanquet supplemented the report by describing more fully the excavations at Prasos, which was, he said, "a house of the third or early part of the original Eteocretan element of the island. The remains on the actual site of Prasos proved to belong to the Geometrical and later periods. Two sanctuaries with votive deposits also came to light, and the remains of a large public building, of Hellenistic date, which might have been carried out by the king." Mr. D. G. Hogarth was then read, on the details of the explorations at Zakro, in Eastern Crete. Mr. Hogarth had discovered a pit containing broken vases of stone and clay, largely of the singular "Kamàres" class, not previously found in Eastern Crete. They were of a highly-developed technique, and their commonest schemes of ornament reappeared unchanged on vases of distinctly "Mycenaean" fabric. A small Mycenaean town had also been uncovered there with well-preserved remains of the lower parts of the houses and magazines. These were erected and inhabited till the close of the eighth century. Their outer walls were Cyclopean, but their inner partitions were of bricks of unusual size,

complete plans had been obtained of two of the largest houses, and parts of others had been explored yielding a great deal of pottery which ranged from the acme of the Mycenaean period till its close. Numerous bronze implements were found, and two tablets in the linear "Cretan" script showed that this system was known though probably in a little advanced stage in the Cretan State. The most important discovery was a deposited hoard of 500 clay impressions of Mycenaean gems and signets displaying 150 different types, affording a priceless record of Mycenaean glyptic art and religious symbolism, and throwing an enormous light on the civilisation of Crete. Furthermore, some interesting cist-graves were found in caves about Zakro, which yielded incised and painted pottery of the pre-Mycenaean age, including types novel in Crete but familiar in Cyprus and Egypt.

Mr. Arthur J. Evans read a paper on the "Neolithic Settlement at Knossos and its Place in the History of Early Egyptian Culture." He said that the hill of Kephali, at Knossos, which contained the remains of the Palace of Minos and early houses going back to the pre-Mycenaean or Kamarires period of Crete, proved to have been the scene of a much earlier and very extensive Neolithic settlement. The site contained an abundance of primitive, dark, hand-made pottery, often punctuated and incised, and with white, chalky inlaying, more rarely chrome-coloured. The ornamentation was angular and of textile derivation. Stone implements abound of greenstone, serpentine, diorite, hematite, jadeite, and other materials. Among these were over 300 axes, besides chisels, adzes, hammers, and other implements. The most characteristic implements, however, were the stone maces, the occurrence of which was especially important as bringing the Cretan stone age into clear relation with that of Anatolia, where, as in the early deposits of Babylonia, stone maces formed a marked feature. This characteristic was shared by proto-dynastic and proto-dynastic Egypt. Another interesting feature among the remains was the small human images, and a mark which supplied the ancestors and prototypes of the stone images found in the early metal-age deposits of Crete and the Cyclades. The Neolithic settlement of Knossos was the first settlement of that period yet explored in the Greek world, and in many ways was the earliest source of light on the beginning of civilisation in that area. There were here no later vase-forms of the high-necked and spouted class, no traces of painted pottery or metal, and no single example of the spiral-form decoration which in the early metal-age deposits was found fully developed. This negative phenomenon strongly weighed in favour of the view that the "Egean spiral" system was introduced during this later period with other decorative types from the Egypt of the Middle Kingdom, where it had already attained a high development. The Neolithic stratum of Knossos itself actually underlay later buildings belonging to three distinct prehistoric classes:—(1) The "Kamarires," or early metal-age period of Crete, approximately dating from c. 2500 to 2200 B.C.; (2) the transitional period between the "Kamarires" age and the Mycenaean, c. 2000 B.C.; (3) the Mycenaean period proper, c. 1500 B.C. It would be rash to bring down the lowest limit of the settlement later than about 3000 B.C.

THE NEW PHYSICAL OBSERVATORY AT BUSHEY.

In the Mathematical Section, Dr. Glazebrook, the Superintendent of the National Physical Laboratory, exhibited a plan of the new institution now being erected at Bushey, gave a short history of the building, and described the objects with which it had been founded. The main building consisted of a central block about 70 ft. square standing on a vaulted basement. At each corner there was a large wing, practically single-storied; the rooms in these were being fitted up for various special purposes. In the central building itself would be two general laboratories. There would be a large entrance hall, arranged as an apparatus-room, and a library. The basement contained a large hall, the size of the first floor had been covered with a thick layer of concrete. The walls were very thick, so that they were extremely steady, and the temperature and conditions all favourable for steady work. In addition, there were other smaller rooms on the basement, two of which were particularly distinguished by thick interior walls, and arrangements would be fitted to maintain a steady temperature throughout the year. At the back was another

wing containing a number of rooms suited for special researches, and there a lift had been fitted and also a mercury column, having a height of about 50 ft. For the more delicate physical work the ground floor and basement of the old house afforded ample accommodation. For the engineering work, a room about 100 ft. high had been built, lighted from the north by a weaving-shed roof. It was divided longitudinally into two bays by a series of rolled steel pillars. The one bay would contain a light travelling crane. Along the other ran a line of shafting for driving the machines and for experimental purposes. Adjoining this laboratory was a drawing office, while the engine-house and boiler-rooms were close at hand. Power, obtained from a 60-kilowatt Parsons turbine, would be distributed electrically to various parts of the laboratories; this form of engine was chosen for the express purpose of avoiding vibration as far as possible. The necessary tools were on order and in course of installation. Apparatus for the photo-micrographic examination of steel rails were being set up, and machines for testing the elastic properties of alloys were in course of construction. Pressure gauges and steam indicators would also be tested. The height of the building would not allow the mercury column, now being erected, to measure more than 200 lb. to the square inch; but apparatus was being constructed for pressures in excess of that amount. Considerable attention was to be given to high temperature thermometry, the testing of platinum thermometers, and the measurement of electrical quantities. Before the end of the year the committee hoped the laboratory would be fully and usefully occupied. Sir Andrew Noble has given an excellent comparator, a dividing engine, and a large number of apparatus of the highest class to the laboratory.

BEACON AND LIGHTHOUSE ILLUMINATION.

Mr. J. R. Wigham described to the Engineering Section a long, continuous-burning petroleum lamp, of construction and bearing. To overcome the difficulty experienced in using oil in buoys and beacons to which access was not readily obtained, he had devised a burner in which the wick was caused to move continuously over a roller. The flame sprang from the extreme loop of the wick, part of which was on the roller, so that a fresh part was constantly presented. The wick was of great length, and the continuous movement was secured by means of a float arrangement. One end of the wick was attached to the float, which was contained in a tube holding oil. The other end of that tube was a drip valve through which the oil escaped drop by drop. As the oil level fell the float followed, and thus, by drawing the wick over the roller mentioned, constantly exposed a fresh part to the flame. In that way the wick did not become charred, and no trimming was needed. Lengths of wick to last six months and a filtering apparatus used in connection with the continuous-burning lamp were exhibited. Mr. Wigham also read a paper on a new scintillating system of lighthouse illumination which he had introduced. That system was an extension of the French "Faro" principle. The value of the latter was founded on the fact that a pulsating beam of light of intermittently augmented intensity, as secured by lenses, was more effective than a fixed light from a similar source. The French lighthouse authorities restricted the duration of each flash to about one-eighth of a second, which was the time needed for its perception. That was obtained by a system of lenses which were made to revolve rapidly round the source of light. Mr. Wigham used 16 large incandescent gas-lights, arranged in a ring of 13 in. diameter. Large annular lenses received the light from the burner, and revolved at 1500 revolutions per minute. With eight lenses 20 flashes were produced each second. With such an interval the light was never wholly extinguished, and thus the eye was continually fixed on the light, instead of having to pick it up at each flash.

WATER SUPPLY PURIFICATION.

Earl Rossa read a paper before the Mechanical Science Section on "An Arrestor for Intercepting Leaves in the Intake of a Water Supply." The apparatus consisted of a cylinder of wire gauze, 4 ft. in diameter and 4 ft. in height, set in an opening in a vertical diaphragm extending across the supply, and revolving at a rate of 1000 or so round a vertical axis. The current flowed through the gauze cylinder in a horizontal direction. The leaves carried down with the

current adhered to the cylinder under pressure of the stream, and were carried round till they reached the diaphragm. The latter on one side was double, with an intervening space of some 10 in., which was connected with the tail-race. When the cylinder had made a sufficient part of a revolution for the current, relatively to the gauze, to be reversed, the leaves were detached and carried by a portion of the water towards the tail-race.

RESISTANCE TO ROAD TRACTION.

Professor H. S. Holo-Shaw read a preliminary report of the committee on "Resistance of Road Vehicles to Traction." This was chiefly devoted to describing the course taken in making the investigations. Some work has been done during the last few months with a motor-car lent to the committee, and experiments have been made on an artificial track so as to test the resistance of various materials.

THE DEATH OF LIGHTNING CONDUCTORS.

In the Engineering Department, the protection of buildings from lightning was introduced by Mr. C. Killingsworth Hedges. Having referred to the very important work done by the Lightning Research Committee jointly organised by the Royal Institute of British Architects and the Surveyors' Institution, the lecturer compared Continental and American practice, and described his rearrangement of the system employed at St. Paul's Cathedral, where the conductors, erected so recently as 1872, were found by him to be totally inefficient. In the plan recommended, both for this installation and for the more recent one at Westminster Abbey, the number of ordinary conductors from air to earth had been greatly increased, and, besides these, horizontal cables had been run on the ridges of the roofs and in other prominent positions so as to encircle the building, being interconnected to the vertical conductors wherever they crossed one another. The horizontal cables were furnished at intervals with aigrettes or spikes, invisible from the ground level, which were designed to give many points of discharge. At the same time, they, in conjunction with the cables, would receive any side flash which might occur should any portion of the building receive a direct stroke of lightning. The unreliability of soldered joints for conductors, whether of cable or tape, had led the author to design a new type. A small amount of tubular earth had also been designed, which took up little space and had the advantage that if a suitable moist ground was not obtainable the desired low electrical resistance was obtained by leading a tube in connection with the rain-water pipes, so that a portion of the rainfall was directed to the tubular earth. The author alluded to the immense amount of damage to property annually occurring which might be prevented if efficient conductors were installed. He mentioned that instead of every church having its lightning conductor not 10 per cent. were so provided; and in the case of other public buildings the percentage was not much larger, the reason of the case of the former class of buildings being that a vicar wishing to safeguard his church had usually to pay the cost out of his own pocket. Architects as a rule treated the question of lightning conductors in a very brief manner, and in their specifications seldom said anything as to the way in which they were to be run, or the necessity for good joints and good earth connections.

A brief discussion followed the reading of this paper, but no fresh matter of importance was brought forward. The speaker pointed out that architects could hardly be expected to pay more attention to protection of buildings from lightning until engineers had definitely decided what practice should be followed, there being at present many conflicting views.

HOUSING OF THE POOR.

In the Section of Economic Science and Statistics, a long discussion took place on "Housing of the Poor." The subject was introduced by the Professor, Mr. Glasgow, who announced the view that the poor had two claims on us—a legal claim and a claim of private charity. The working classes had neither of these claims, and any housing policy which was based on a recognition of the fact that the poor had no claim was unsound. There was a failure, he proceeded, of private enterprise to meet the demand for small houses satisfactorily. Cheaper houses must be provided, but how? Semi-philanthropic bodies might bring on a large

scale, limiting their profits, or municipalities might build, own, and rent. No municipality could think of or hope to house all those who wanted cheap houses, and therefore a municipality ought to decide that it was going to house a certain section of the working classes. But what class was that to be? If they were going to house the poor, it should be recognised that this was poor relief in one of its forms. Municipalities might build and rent simply as pioneers with a view to showing what could be done by private enterprise. In that case they should clearly demonstrate what the result would be. If they decided to build for the working classes the result should be referred to the position of affairs. If they were subsidising a class, was the subsidy to remain with that class or was it to go where it was never intended? When houses were supplied below cost the loss would have to be borne by the ratepayers, and the problem arises—Was it fair to tax the working classes generally for the purpose of providing for one section of them? Lord Provost Chisholme gave some information concerning the operation of the City Improvement Trust in Glasgow, but said he thought the crux of the question to be a moral one, and he looked to other agencies for increasing stimulus to dealing with the people while the municipality attempted to deal with their houses. A decent house to live in at a rental of £4 10s. he regarded as a necessity for the lowest grades of the working classes.

The Association Congress was closed on Wednesday, and will meet next year at Belfast.

"BUILDING NEWS" DESIGNING CLUB.

AN ARCHITECT'S HOUSE.

THE concluding subject for the session 1900-1901 has proved a very popular one, judging by the number and variety of the plans received. Some of the designs are certainly above the average in merit, and the interest which naturally belongs to the problem of building a house for an architect's own occupation is thereby no doubt very much increased. We are glad that the work of the session ended so well, and specially so because on some occasions the schemes submitted by the members of the Club were not only of merit, but they were below the standard of merit exhibited by competitors in previous years. Time, however, is only wasted over regrets, and our business is to look forward, in the assured conviction that our subscribers include among their ranks quite as capable a number of workers as heretofore, who are determined to avail themselves of the chances we offer in our Club for self-advancement and in the exercise of the study of design. "Cui bono?" only orders the half-hearted, and the question, asked in a proper sense, is furnished with its best answer by the experience of those who have by continued effort learned to make friends with success. The works of the competitors for this the last subject more than justify these somewhat trite reflections, which we offer in the hope of encouraging new men to enter the lists when the Designing Club resumes its work early in October after the annual holidays are over.

The following were the conditions issued as a guide to the competitors for the contest in question:—An Architect's House, with offices, in a town, on a site 28ft. by 60ft., facing the market-place on the west end, and having a return frontage on the west link in a side street, in which direction the office entrance is to be located. The private entrance is to be on the south frontage, which is to set back 4ft. 6in. to light the basement by an area. The office accommodation to provide a good entrance and waiting-lobby, a private office for principal staff, by lobby, or of about that area; a drawing-office for assistants, a lavatory, etc., &c. An inclosed space must be provided for three bicycles, so placed as to be accessible for the assistants' machines. The house to be distinct from the office, with a pass-door, so arranged that no servants may readily enter the office-door after business hours. A good large living-room on the ground floor. Kitchen, scullery, &c., in the basement, and a tradesman's door, drawing-room on first floor, and five bedrooms in the rest of the house, with bathroom, two closets (one being in basement), and box-room. Good staircase in the central, and a well-lighted hall. A sense of roominess combined with compactness is desirable. The exterior to be in

ashlar stone, and to be treated with mullioned windows in an architectural style adapted to an architect's professional establishment—in a dignified, but not ornate, manner. The walls of the upper part may be slate-hung, at option of designer. Sufficient drawings to illustrate the design properly, and a sketch if space will allow. Size of paper, 24in. by 18in. It is to be in stone and "Robin Hood" third. We illustrate all three designs. "Iona" is decidedly the best. Architecturally the façades are broadly handled, though the necessity of many windows presented some difficulty in the way of obtaining breadth. The ground floor is a fine one, with the large areas lighting the back stairs, the waiting-hall, and stores, &c., are small. The latter is greatly increased above the ground-floor level, and in judging these objections it is to be remembered that the site is restricted and the requirements are considerable. The office contrivances are ingenious, and if space is not employed, he could use the room marked for stores; old competition strainers and such-like properties of an architect's business could be put in the cycle room, where a sink near the window would be useful. A door shuts off the house, and the principal's room, having no door opening into the cycle room, is isolated from it. It is a fine one "within doors." The entrance-hall is roomy, but we doubt as to the staircase getting up to the first floor in the space precisely shown. It would need some modification and curtailment of the area of the hall to do it nicely. The first-floor corridor is too wide for the size of the house, and the space could be obtained by the entrance hall, reducing the landing. The bedrooms are not conveniently contrived, with their doorways opening right on to the fireplaces, and the big room on the top floor has no fireplace at all, which is an oversight, seeing that one could easily come in, on the right over the bathroom wall, a fireplace, and on the other side, in the bathroom, a fireplace is hardly necessary. The flue from the ingle-nook below would warm that apartment quite enough in the ordinary way. The proportions of the drawing-room are not quite tasteful, though the arch over the bay would modify this effect.

"Thurms," the second designer, gets the advantage of a space at the rear, and runs his bikes into it, and decides to go down a slope, and does not brought indoors through the office. The principal's office is cut up with three doors: one would have been enough. The waiting space is not well utilised, being so much used as a passage way; but the internal areas for light are bigger. The back stairs to the top floor is hardly wanted. The entrance hall is an encumbered one, and the drawing-room is hardly a success. Externally, the elevations are too broken up with one thing and another. The chimneys are strange with their umbrella-like projections in lieu of a cornice, while the set-offs to the dining-room breast outside are not very happy in their lines.

"Robin Hood," the third man, puts two bays to the narrow front, which is too much to do, even though they are so flat, and when the plan is looked at we see with what an effort they are managed. The fireless "own room" would be a lumber den, and the ingle-nook in the drawing-room fits into the bay in a laboured fashion. The cycle room, occupying the space, is not wanted needlessly, while inside the front door the stairs hardly leave room for it to open properly. The area to the pantry and larder is much too small, and the w.c. is so placed that the pipe must go down through the pantry and servants' hall, or traverse the ceiling of the former in an objectionable way to reach the area. The upper part of the building only amounts to so much lost space. The back bedrooms, 3 and 4, have no fireplace, and there is none in the servants' bedroom. The overlooking of the windows between the last-named apartments would be most objectionable. We get "Robin Hood" in a thick cloud with a degree of confusion, but judging one thing against another we cannot substitute the next best plan for this. "Corinthus" design is, however, in some ways a striking one with a big bay rising on the Market-square front right up from the pavement, and the fore part of his house is treated in a tower-like fashion emphasised by a coned roof, the upper stage of the walls being in half timber. This narrow elevation is broken by recessing the portion where the entrance occurs. The plan is not over-elaborated, and it has a practical air—somewhat crude, perhaps, in parts, like the exterior, which is obviously lacking

in interest of detail, what detail there is being commonplace and rather tasteless, and placed in the centre of the offices is a poor ornament. "Pierrot" has distinct merit, his design being picturesquely handled with a variety of skyline produced by an arrangement of gables. The proportions of the side show taste, but the building is too lean and up to be really good; while in points of detail, as in the cornice, and over the dining-room window, there is an absence of refinement. The office part of the house is roomy and suitable. The design is certainly one of the best. "Prius" comes next with rather coarsely-drawn elevations and view of a house which probably would look very interesting in execution. Here it appears sparse of character. The plan is wasteful in passage ways, though the scheme generally is well thought out and painstaking, with more facilities for light than can be found in plans placed higher. "1901" might have done better, for his drawings display taste and a sense of grouping well as the value of solid wall-space. The semi-circular arch to the parlour window looks awkward brought so near at the springing to the angle of the house. The porch is positively ugly with its battered buttresses and segmental arch. "Pencil Point" tries stepped gables and a mild intensive kind of Tudor for the fenestration, recalling the C. 15th style, stations erected some thirty-five years ago. The plans are rather good, though the stairs with a big well hole would be rather dark. The adjacent area ought to have been utilised for lighting the different stages and landings, as well as the steps down to the basement, where a window does occur. "Indiana" fails to place his plan in over-elaboration. The treatment, as a matter of fact, is bald. The porch with eaved sides, if better detailed, would look quaint and uncommon, but as we see it in juxtaposition with the crude return elevation it looks out of accord with the remainder. "Premier" is more unpretentious than those which follow, and he places his plan, not that we otherwise can admire his proposal. The segmental oriel window on the first floor is supported by a strange device rising between the mullioned window below like chamfered wooden brackets. "Premier" at least does light his house, and light is very welcome. "Renaissance" "Val" adopts a somewhat old-fashioned style with shaped gables and oriel bays finished off in a not very attractive mode, with little idea of shape-lines. "Hare" is more commonplace still. The narrow passages in his plan go far to mar the arrangements. "Duncan" sends a design having all-over look, and type entrances all of about the same prominence, that for tradesmen coming badly into one side of the entrance-hall under the main stairs at the head of the basement steps inside the house. "Chips" calls for little comment, for it is a very elementary performance which he sends in. "Engberg" emphasises the angle of the entrance with a type entrance of a turret rising over the drawing-room oriel. The housemaid could not answer the office door after office hours without going through the master's private room. "Zisca" finishes the series with drawings showing the window panes blacked in a chequered way, which spoils the effect. Over the front door there is a simple classical female figure which hardly strike one as being in harmony with the purpose of the building, or in agreement with the paucity of conception illustrated by "Zisca."

THE PROPOSED CATHEDRAL FOR LIVERPOOL: FINAL DECISION AS TO SITE.

A MEETING of the Liverpool Cathedral Executive Committee was held at the Liverpool Church House on Monday, Sir W. B. Forwood presiding, the bishop of the diocese being also present. An unexpected feature of the proceedings was a letter from the late Mr. Gladstone's wishes, contained in a letter from the Dean of Lincoln to the bishop dated July 13 last. Dr. Wickham inclosed a contribution to the Cathedral Building Fund, adding: "It is in part a gift from one who has the custody of one of our old cathedrals, but it has also an interest in it, the building fund. If you have not been told the story before, you will be interested, I think, to know that on the last occasion on which I heard Mr. Gladstone talk at dinner in anything like his old way (at Cannes in February, 1898, after a day of comparative ease from pain), he amused us by suddenly exclaiming: 'I wish somebody would give me a million of

money. 'What would you do with it?' 'I would spend most of it in building a cathedral and founding a Chapter at Liverpool.' With reference to the site provisionally adopted, that of St. James' Mount, a report was submitted by the surveyor to the diocese, Mr. Geo. Bradbury, who stated that he had obtained from Mr. Sheldermine, the city surveyor, permission to make excavations upon St. James' Mount to ascertain whether the rock had been excavated when St. James' Cemetery had been used as a stone quarry. He found that the original yellow sandstone rock existed at a reasonable depth, and he pronounced the site to be "very good, and quite capable of sustaining any building that might be placed on this particular spot." The necessity for deep foundations would only arise if the cathedral walls closely approached the cemetery wall. With regard to the levels of the surrounding streets above the mean water-level, St. James' road was 130ft. at the north end and 126ft. at the south or Upper Parliament-street end. The corner of Hope-street and Gambier-terrace was 158ft., and the corner of Hope-street and Upper Parliament-street 147ft. Taking account of these levels, the site at about the centre line nearly opposite Huskisson-street, the top of St. James' Mount was 20ft. above St. James' road, the exact level of the soil against the cemetery wall being 17ft. 9in. above St. James' road. The bottom of the cemetery was 27ft. below St. James' road, the site at about the top of St. James' Mount. Hope-street, fronting Gambier-terrace, was on the same mean level as the top of St. James' Mount. In conclusion, he reported: "There is ample space on the northern portion of the Mount for the erection of the proposed cathedral. The foundations will present no exceptional difficulties, and their cost will compare favourably with other suggested sites."

The report was approved, and the St. James site adopted as satisfactory, and it was resolved that negotiations be opened with the corporation for the acquisition of so much of the land as might be needed for cathedral purposes. The following committees were afterwards appointed:—General purposes, building, finance, and organisation, for the purpose of collecting subscriptions and organising committees in the diocese.

SEWAGE AND THE BACTERIAL PURIFICATION OF SEWAGE.*

THIS is a new edition of a valuable work on sewage and bacterial purification which we met last year. Dr. Rix has done his best, and has rapidly sold that a new edition has been called for. The work has been thoroughly revised and brought up to date, and by condensation of some portions of the work much new matter has been added. A considerable portion of this work deals with the remarkable success of the bacterial treatment of sewage, the principles of which are here clearly and adequately stated. The earlier chapters treat of the methods of disposal, chemical analysis of sewage and effluents, chemical changes produced by bacteria, irrigation, subsidence, and precipitation processes, and the use of heat, chemicals, and electricity, and give a very complete summary of all methods and processes that have been employed. Considerable knowledge of chemical analysis is presumed in the readers of these chapters. The chemical changes produced by bacteria are discussed in several chapters. The progress of science has changed the whole aspect of the question of purification. The author says truly enough, "Thirty years ago methods of upward filtration were suggested in the place of chemical precipitation, and the results were so satisfactory that it is difficult to understand how authorities almost universally adopted the chemical treatment. There can be no doubt that in slow-repulsed filtration of sewage the arrested suspended matter slowly disappears just in the same way as when the solid matter of sewage is being removed by straining or by chemical precipitation, subsequently disappears when dug into the ground or buried beneath the surface." The terms "decay," "putrefaction" were once used to express these changes, now the term "hydrolysis" is used by the chemists, and the breaking down of organic matter. "Preliminary digestion takes place before the final oxidation of the elements. But solid organic matter capable of undergoing change, even in the presence of air,

can only oxidise directly on its surface." "Similarly, organic matter in solution seldom oxidises directly to its final oxidation products, but passes through intermediate conditions until the more complex organic forms are resolved into others of more simple structure, and these are subsequently burnt up to the stable oxidised compounds, water and carbonic acid." Dr. Rix deals with the "first to point out that when certain changes are brought about by organisms which are facultative anaerobes, the breaking down of gelatine to albumoses, monomeric peptides, &c., is not accompanied by any absorption of oxygen, or the formation of any oxidised products," and it is obvious that in the process of digestion "both nitrogenous and non-nitrogenous foods are digested in the stomach and intestines before the products are absorbed by the blood, and so rendered useful by oxidation," the process by which different substances undergo chemical changes. Summarising the order of changes, the initial stage in transient aerobic changes by the oxygen of the water supply rapidly passing to first stage by anaerobic liquefaction and perforation by hydrolysis; second stage, anaerobic breaking down of the intermediate dissolved bodies; the third stage, complete aerobic nitrification—several interesting experiments. The history and progress of bacterial purification form the subjects of subsequent chapters. The only experiments are described by Muller, Pasteur, of Koch, and other observers of the phenomena of fermentation, which showed that the changes were biological—not chemical. The experiments at Massachusetts, Sutton, Oswestry, and Leeds are pointed out, and the methods of distribution described and illustrated; and several systems are mentioned, such as the Duval system, tried at Hendon, Sutton, and lately at Leeds. Many methods of treatment on the principle of bacterial purification are now on trial and show satisfactory results. We refer the reader to Dr. Rix's useful work for details.

HOW TO ESTIMATE: OR, THE ANALYSIS OF BUILDERS' PRICES.—XXIV.

By JOHN T. RIA, F.S.I., Surveyor, War Dept.

VARIOUS LABOURS.

THE following are some constants of labour for ordinary work on fir, which have been extracted from the treatises of Leaning, Hurst, and Fletcher. Labour on hardwoods may be generally taken at twice as valuable. These constants represent the theoretical time, and the practical estimator seldom employs them.

Labour fixing plates, linels, &c. building	Hours of a Carpenter.
Taken in bricklayer	per ft. cube 40
Ditto ground joints	50
Ditto framing breaking joints and trimmers	100
Ditto carport-partitions, tenoned	100
Ditto ditto and trussed	123
Ditto fixing fir in roofs	90
Ditto in roof trusses, exclusive of hoisting	123
Ditto in ceiling joists	100
Ditto in roof thought and framed	200
Ditto ditto and rebated	315
Ditto ditto ditto and beaded	330
Ditto ditto proper door casing	370
Chamfers, lin. wide and under, straight, labour only	per ft. run 92
Ditto ditto cross-grain ditto	93
Ditto ditto circular ditto	93
Ditto ditto straight ditto	93
Ditto ditto circular ditto	93
Ditto ditto straight ditto	93
Ditto ditto cross-grain ditto	12
Ditto ditto circular ditto	12

If foregoing are stopped, increase constant by one-half.

Cutting, 2in. thick and under, raking.	per ft. run
Labour only	90
Ditto ditto circular ditto	90
Groove, plough, straight, ditto	90
Notching or cutting, lin. and 1 1/2in. ditto	90
Plugging, labour only	90
Rebates, not exceeding 2in. girth, straight, labour only	90
Ditto ditto cross-grain ditto	90
Ditto ditto circular ditto	12
Ditto ditto straight ditto	90
Ditto ditto circular ditto	12
Edges shot, lin. and under	per 100ft. run 70
Labour only	20
Mouldings, 2in. girth and under, straight, labour only	per ft. run 12
Ditto ditto cross-grain ditto	18
Ditto ditto circular ditto	21
Ditto over 2in. girth, straight, ditto	per ft. super. 72
Ditto ditto cross-grain ditto	108
Ditto ditto circular ditto	140
Ditto including double architraves, ditto	140

If foregoing are stopped, increase the constant by one-half.

Battening, including plugging to wall, 2in. to 1 1/2in. at 12in. centres	per square 2 50
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Fixing only, lin. rough boarding to roofs.	Hours of a Carpenter.
Edges shot, straight, 2in. and under	per square 30
Ditto 1in. ditto	33
Ditto 1 1/2in. ditto	33
Ditto cladding to 4in. squares	33
Ditto inboard-fell to roofs	1 3/4
Ditto sound boarding and fillets	3 3/4
Ditto cladding to walls	10 00
Ditto centring to concrete floors	6 30
Ditto gutter-boards and beams	per ft. super. 30
Ditto cladding to 4in. squares	33
Ditto ditto to openings	33
Ditto brackling for corners	per ft. run 24
Ditto cladding to 4in. squares	33
Ditto ditto 5in. ditto	21
Ditto rough fillet	33
Ditto rolls for lead	33
Ditto cladding to 4in. squares	33
Ditto ditto 5in. to 12in. joints	17
Ditto grooves for skirtings, &c.	33
Primed partitions, 1 1/2in. square framed, per ft. super.	33
Ditto ditto 5in. to 12in. joints	17
Ditto ditto ditto, if moulded, o.s.	10
Ditto ditto ditto ditto	20
Labour from bench, lin. shaves, wood, no bars	20
W.C. flaps and frames, fixing and hanging	14
Shutters, lin. deal, two-panel, square frames	100
Ditto, add for every extra panel	14
Ditto, add if bead-butt or moulded, o.s.	12
Ditto, add if hung in two heights	12
Skirtings, including backings, &c., fixed	33
concealed	40
Ditto, add if beaded or chamfered	13
Ditto, add if tinned	13
Ditto, add if tinned	13
Window backs, elbows, and soffits, lin. deal, two-panel	70
Ditto, add for each extra panel	30
Ditto, add if bead-butt or moulded	10

Other constants are given further on with various items of work.
A carpenter will take 12hrs. to scarf a joint, 18in. long, in a 3in. by 3in. purlin.
Ditto, the scarf, 2in. by 1in. ridge.
Ditto, 1hr. to prepare 12ft. run of 4in. by 3in. about 1 1/2in. wallplate, ready for bricklayer to bed.

NAILS AND SCREWS.

It will be convenient to consider here the cost of nails and screws before proceeding to the question of fixing work. Steel nails are the best, and "cut clasp" are mostly used. Their uniformity of size and make, with freedom from waste, renders them cheaper to use, especially as their price is but slightly in excess of iron ones. As a general rule, the lengths are determined by taking rather more than twice the thickness of wood to be fixed. For instance, 1 1/2in. flooring would require 2 1/2in. or 3in. nails. This custom, however, applies more to boarding and would be modified in the case of scantlings of considerable size. The following lists will indicate the lengths, weights, and net prices at glance. It will be observed that the smaller the nail the higher the price per cwt. Allow 5 p.c. for waste in fixing.

NAILS, STEEL.			
	Per 1,000.		Percent.
Spike	5in. weigh	130lb. and cost	18 0
"	6	268	17 6
"	7	375	16 0
"	8	525	16 0
"	9	683	16 0
"	10	900	15 0
Rose-head	1in. weigh	3lb. and cost	24 0
"	1 1/2	4	21 0
"	2	5	18 0
"	2 1/2	7	15 0
"	3	10	11 6
"	3 1/2	13	11 0
"	4	18	12 0
"	4 1/2	21	14 0
"	5	24	12 6
"	5 1/2	26	12 0
"	6	32	12 0
"	6 1/2	36	11 9
"	7	42	11 4
"	7 1/2	48	11 0
Cut chisp	1in. weigh	1lb. and cost	20 0
"	1 1/2	2	13 0
"	2	3	10 0
"	2 1/2	4	11 0
"	3	5	12 0
"	3 1/2	6	10 6
"	4	7	10 0
"	4 1/2	8	10 6
"	5	9	10 0
"	5 1/2	10	10 0
"	6	11	10 0
Wrought brads	1in. weigh	1lb. and cost	20 0
"	1 1/2	2	13 0
"	2	3	10 0
"	2 1/2	4	11 0
"	3	5	12 0
"	3 1/2	6	10 6
"	4	7	10 0
"	4 1/2	8	10 6
"	5	9	10 0
"	5 1/2	10	10 0
"	6	11	10 0
"	6 1/2	12	10 0
"	7	13	10 0
"	7 1/2	14	10 0
"	8	15	10 0
"	8 1/2	16	10 0
"	9	17	10 0
"	9 1/2	18	10 0
"	10	19	10 0
"	10 1/2	20	10 0
"	11	21	10 0
"	11 1/2	22	10 0
"	12	23	10 0
"	12 1/2	24	10 0
"	13	25	10 0
"	13 1/2	26	10 0
"	14	27	10 0
"	14 1/2	28	10 0
"	15	29	10 0
"	15 1/2	30	10 0
"	16	31	10 0
"	16 1/2	32	10 0
"	17	33	10 0
"	17 1/2	34	10 0
"	18	35	10 0
"	18 1/2	36	10 0
"	19	37	10 0
"	19 1/2	38	10 0
"	20	39	10 0
"	20 1/2	40	10 0
"	21	41	10 0
"	21 1/2	42	10 0
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"	160	319	10 0
"	160 1/2	320	10 0
"	161	321	10 0
"	161 1/2	322	10 0
"	162	323	10

BRASS SCREWS, FLATHEAD, PER GROSS.

Gauge No.	1in.	1 1/4in.	1 1/2in.	1 3/4in.	2in.	2 1/4in.	2 1/2in.	2 3/4in.	3in.
4	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
5	1 6	1 10	—	—	—	—	—	—	—
6	1 7	2 0	—	—	—	—	—	—	—
7	1 9	2 3	2 9	3 3	4 0	—	—	—	—
8	2 0	2 6	3 0	3 7	4 4	5 3	—	—	—
9	2 1	3 0	3 4	4 0	4 8	5 6	6 3	7 0	—
10	2 2	3 1	3 5	4 1	5 0	5 9	6 7	7 5	8 3
11	2 3	3 2	3 6	4 2	5 1	6 0	6 9	7 8	8 7
12	2 4	3 3	3 7	4 3	5 2	6 1	7 0	7 9	8 8
13	2 5	3 4	3 8	4 4	5 3	6 2	7 1	8 0	8 9
14	2 6	3 5	3 9	4 5	5 4	6 3	7 2	8 1	9 0
15	2 7	3 6	4 0	4 6	5 5	6 4	7 3	8 2	9 1
16	2 8	3 7	4 1	4 7	5 6	6 5	7 4	8 3	9 2
17	2 9	3 8	4 2	4 8	5 7	6 6	7 5	8 4	9 3
18	3 0	3 9	4 3	4 9	5 8	6 7	7 6	8 5	9 4
19	3 1	4 0	4 4	5 0	5 9	6 8	7 7	8 6	9 5
20	3 2	4 1	4 5	5 1	6 0	6 9	7 8	8 7	9 6
21	3 3	4 2	4 6	5 2	6 1	7 0	7 9	8 8	9 7
22	3 4	4 3	4 7	5 3	6 2	7 1	8 0	8 9	9 8
23	3 5	4 4	4 8	5 4	6 3	7 2	8 1	9 0	9 9
24	3 6	4 5	4 9	5 5	6 4	7 3	8 2	9 1	10 0
25	3 7	4 6	5 0	5 6	6 5	7 4	8 3	9 2	10 1
26	3 8	4 7	5 1	5 7	6 6	7 5	8 4	9 3	10 2
27	3 9	4 8	5 2	5 8	6 7	7 6	8 5	9 4	10 3
28	4 0	4 9	5 3	5 9	6 8	7 7	8 6	9 5	10 4
29	4 1	5 0	5 4	6 0	6 9	7 8	8 7	9 6	10 5
30	4 2	5 1	5 5	6 1	7 0	7 9	8 8	9 7	10 6
31	4 3	5 2	5 6	6 2	7 1	8 0	8 9	9 8	10 7
32	4 4	5 3	5 7	6 3	7 2	8 1	9 0	9 9	10 8

per foot cube. No nails are necessary. The labour here is one hour carpenter.

1ft. cube of rough fir, delivered on site. s. d.
Framing and fixing, 1 hour carpenter at 10d. 0 10

Add 10 per cent. profit 3 2
0 4

Cost per foot cube 3 6

A carpenter will fix 20 purlin cleats, 12in. by 5in. by 4in., per 100 on roof.

Fir, wrought, ditto.—In roofs and trusses there will be double the proportion of planing assumed in wrought plates, joists, &c., and this is generally reckoned at 8ft. super. per cubic foot of fir, owing to the large quantity of wrought face compared with the cube contents of timber.

1ft. cube of rough fir, as before s. d.
Planing, 8ft. super. at 10d. 2 4
Framing and fixing, 1 hour carpenter at 10d. 0 10

Add 10 per cent. profit 3 10
0 4 1/2

Cost per foot cube 4 2 1/2

For hoisting trusses a handy calculation is to multiply the two dimensions together and divide by 10, the quotient to be taken as pence. Thus to raise a truss 20ft. span, 30ft. high—
20 x 30 = 600 ÷ 10 = 60s., or 5s.

IRON SCREWS, FLATHEAD, PER GROSS.

Gauge No.	1in.	1 1/4in.	1 1/2in.	1 3/4in.	2in.	2 1/4in.	2 1/2in.	2 3/4in.	3in.
1	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
2	0 8	—	—	—	—	—	—	—	—
3	0 9	—	—	—	—	—	—	—	—
4	0 10	—	—	—	—	—	—	—	—
5	0 11	1 0	—	—	—	—	—	—	—
6	0 12	1 1	1 0	1 3	—	—	—	—	—
7	0 13	1 2	1 1	1 4	1 6	—	—	—	—
8	0 14	1 3	1 2	1 5	1 7	1 10	—	—	—
9	0 15	1 4	1 3	1 6	1 8	1 11	2 0	—	—
10	0 16	1 5	1 4	1 7	1 9	1 12	2 1	2 3	—
11	0 17	1 6	1 5	1 8	2 0	2 3	2 4	2 8	—
12	0 18	1 7	1 6	1 9	2 1	2 4	2 5	3 0	3 4
13	0 19	1 8	1 7	2 0	2 2	2 5	2 6	3 1	3 5
14	0 20	1 9	1 8	2 1	2 3	2 6	2 7	3 2	3 6
15	0 21	2 0	1 9	2 2	2 4	2 7	2 8	3 3	3 7
16	0 22	2 1	2 0	2 3	2 5	2 8	2 9	3 4	3 8
17	0 23	2 2	2 1	2 4	2 6	2 9	3 0	3 5	3 9
18	0 24	2 3	2 2	2 5	2 7	3 0	3 1	3 6	4 0
19	0 25	2 4	2 3	2 6	2 8	3 1	3 2	3 7	4 1
20	0 26	2 5	2 4	2 7	2 9	3 2	3 3	3 8	4 2
21	0 27	2 6	2 5	2 8	3 0	3 3	3 4	3 9	4 3
22	0 28	2 7	2 6	2 9	3 1	3 4	3 5	4 0	4 4
23	0 29	2 8	2 7	3 0	3 2	3 5	3 6	4 1	4 5
24	0 30	2 9	2 8	3 1	3 3	3 6	3 7	4 2	4 6
25	0 31	3 0	2 9	3 2	3 4	3 7	3 8	4 3	4 7
26	0 32	3 1	3 0	3 3	3 5	3 8	3 9	4 4	4 8
27	0 33	3 2	3 1	3 4	3 6	3 9	4 0	4 5	4 9
28	0 34	3 3	3 2	3 5	3 7	4 0	4 1	4 6	5 0
29	0 35	3 4	3 3	3 6	3 8	4 1	4 2	4 7	5 1
30	0 36	3 5	3 4	3 7	3 9	4 2	4 3	4 8	5 2
31	0 37	3 6	3 5	3 8	4 0	4 3	4 4	4 9	5 3
32	0 38	3 7	3 6	3 9	4 1	4 4	4 5	5 0	5 4
33	0 39	3 8	3 7	4 0	4 2	4 5	4 6	5 1	5 5
34	0 40	3 9	3 8	4 1	4 3	4 6	4 7	5 2	5 6
35	0 41	4 0	3 9	4 2	4 4	4 7	4 8	5 3	5 7
36	0 42	4 1	4 0	4 3	4 5	4 8	4 9	5 4	5 8
37	0 43	4 2	4 1	4 4	4 6	4 9	5 0	5 5	5 9
38	0 44	4 3	4 2	4 5	4 7	5 0	5 1	5 6	6 0
39	0 45	4 4	4 3	4 6	4 8	5 1	5 2	5 7	6 1
40	0 46	4 5	4 4	4 7	4 9	5 2	5 3	5 8	6 2
41	0 47	4 6	4 5	4 8	5 0	5 3	5 4	5 9	6 3
42	0 48	4 7	4 6	4 9	5 1	5 4	5 5	6 0	6 4
43	0 49	4 8	4 7	5 0	5 2	5 5	5 6	6 1	6 5
44	0 50	4 9	4 8	5 1	5 3	5 6	5 7	6 2	6 6
45	0 51	5 0	4 9	5 2	5 4	5 7	5 8	6 3	6 7
46	0 52	5 1	5 0	5 3	5 5	5 8	5 9	6 4	6 8
47	0 53	5 2	5 1	5 4	5 6	5 9	6 0	6 5	6 9
48	0 54	5 3	5 2	5 5	5 7	6 0	6 1	6 6	7 0
49	0 55	5 4	5 3	5 6	5 8	6 1	6 2	6 7	7 1
50	0 56	5 5	5 4	5 7	5 9	6 2	6 3	6 8	7 2
51	0 57	5 6	5 5	5 8	6 0	6 3	6 4	6 9	7 3
52	0 58	5 7	5 6	5 9	6 1	6 4	6 5	7 0	7 4
53	0 59	5 8	5 7	6 0	6 2	6 5	6 6	7 1	7 5
54	0 60	5 9	5 8	6 1	6 3	6 6	6 7	7 2	7 6
55	0 61	6 0	5 9	6 2	6 4	6 7	6 8	7 3	7 7
56	0 62	6 1	6 0	6 3	6 5	6 8	6 9	7 4	7 8
57	0 63	6 2	6 1	6 4	6 6	6 9	7 0	7 5	7 9
58	0 64	6 3	6 2	6 5	6 7	7 0	7 1	7 6	8 0
59	0 65	6 4	6 3	6 6	6 8	7 1	7 2	7 7	8 1
60	0 66	6 5	6 4	6 7	6 9	7 2	7 3	7 8	8 2
61	0 67	6 6	6 5	6 8	7 0	7 3	7 4	7 9	8 3
62	0 68	6 7	6 6	6 9	7 1	7 4	7 5	8 0	8 4
63	0 69	6 8	6 7	7 0	7 2	7 5	7 6	8 1	8 5
64	0 70	6 9	6 8	7 1	7 3	7 6	7 7	8 2	8 6
65	0 71	7 0	6 9	7 2	7 4	7 7	7 8	8 3	8 7
66	0 72	7 1	7 0	7 3	7 5	7 8	7 9	8 4	8 8
67	0 73	7 2	7 1	7 4	7 6	7 9	8 0	8 5	8 9
68	0 74	7 3	7 2	7 5	7 7	8 0	8 1	8 6	9 0
69	0 75	7 4	7 3	7 6	7 8	8 1	8 2	8 7	9 1
70	0 76	7 5	7 4	7 7	7 9	8 2	8 3	8 8	9 2
71	0 77	7 6	7 5	7 8	8 0	8 3	8 4	8 9	9 3
72	0 78	7 7	7 6	7 9	8 1	8 4	8 5	9 0	9 4
73	0 79	7 8	7 7	8 0	8 2	8 5	8 6	9 1	9 5
74	0 80	7 9	7 8	8 1	8 3	8 6	8 7	9 2	9 6
75	0 81	8 0	7 9	8 2	8 4	8 7	8 8	9 3	9 7
76	0 82	8 1	8 0	8 3	8 5	8 8	8 9	9 4	9 8
77	0 83	8 2	8 1	8 4	8 6	8 9	9 0	9 5	9 9
78	0 84	8 3	8 2	8 5	8 7	9 0	9 1	9 6	10 0
79	0 85	8 4	8 3	8 6	8 8	9 1	9 2	9 7	10 1
80	0 86	8 5	8 4	8 7	8 9	9 2	9 3	9 8	10 2
81	0 87	8 6	8 5	8 8	9 0	9 3	9 4	9 9	10 3
82	0 88	8 7	8 6	8 9	9 1	9 4	9 5	10 0	10 4
83	0 89	8 8	8 7	9 0	9 2	9 5	9 6	10 1	10 5
84	0 90	8 9	8 8	9 1	9 3	9 6	9 7	10 2	10 6
85	0 91	9 0	8 9	9 2	9 4	9 7	9 8	10 3	10 7
86	0 92	9 1	9 0	9 3	9 5	9 8	9 9	10 4	10 8
87	0 93	9 2	9 1	9 4	9 6	9 9	10 0	10 5	10 9
88	0 94	9 3	9 2	9 5	9 7	10 0	10 1	10 6	11 0
89	0 95	9 4	9 3	9 6	9 8	10 1	10 2	10 7	11 1
90	0 96	9 5	9 4	9 7	9 9	10 2	10 3	10 8	11 2
91	0 97	9 6	9 5	9 8	10 0	10 3	10 4	10 9	11 3
92	0 98	9 7	9 6	9 9	10 1	10 4	10 5	11 0	11 4
93	0 99	9 8	9 7	10 0	10 2	10 5	10 6	11 1	11 5
94	0 100	9 9	9 8	10 1	10 3	10 6	10 7	11 2	11 6
95	0 101	10 0	9 9	10 2	10 4	10 7	10 8	11 3	11 7
96	0 102	10 1	10 0	10 3	10 5	10 8	10 9	11 4	11 8
97	0 103	10 2	10 1	10 4	10 6	10 9	11 0	11 5	11 9
98	0 104	10 3	10 2	10 5	10 7	11 0	11 1	11 6	12 0
99	0 105	10 4	10 3	10 6	10 8	11 1	11 2	11 7	12 1
100	0 106	10 5	10 4	10 7	10 9	11 2	11 3	11 8	12 2

Proper Fir Door-Frames, wrought, framed, chamfered, or beaded, and fixed.—These would be similarly worked out. The following constants of labour will be useful in this respect:—

Wrought, rebated, and beaded or chamfered. Hours of a
fixed door-frames, labour, making, and
fixing.

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ILLUSTRATIONS.

BANK BUILDING, PRINCE'S STREET, E.C.—WEST OF ENGLAND SKETCHES.—HOUSE AT BASFORD, NEW HUNTING BOX AT GREAT BOWDEN.—COTTAGES AND FACTORY AT SILLEY.—AN ARCHITECT'S HOUSE AND OFFICE.

Our Illustrations.

BANK BUILDING, PRINCE'S STREET, CITY.

This large block of commercial buildings is now in course of erection at the corner of Prince's-street, and facing Ludbury, E.C., for the Governor and Company of the Bank of England. The architect is Mr. Arthur C. Blomfield. The drawing reproduced herewith occupied a prominent position on the walls of the Architectural Gallery of the Royal Academy this year. Owing to the absence from home of the architect, we have no further particulars to hand.

WEST OF ENGLAND SKETCHES.

Shepton Mallet Market Cross, erected 1500. Hexagonal on plan, and surmounted by a pinnacled shaft, 51ft. high, ornamented with niches. Having become ruinous, it was carefully restored in 1841.—*Verneyre to Chapter-House, Wells Cathedral*.—From the east side of the north transept a door opens to this fine staircase, which ascends to the chapter-house. It is lighted by two geometrical windows. The corbels supporting the first vaulting shafts on either side, representing a monk and a nun trailing on serpents, should be noticed. The staircase is not unworthy of the magnificent chapter-house to which it leads, the finest of its date in England.—*St. Martin's, West Leicester*, one of the few remaining picturesque corners in this ancient town. On the side facing the church, is the old Town-hall, dated 1500. The church, which is one of the oldest in Leicester, stands on the site of an old Roman temple.

HOUSE AT BASFORD.

The architect of this house, of which we give plan and perspective, is Mr. Edwin T. Hall.

NEW HUNTING BOX AT GREAT BOWDEN.

This hunting-box has been erected for Mr. J. H. Stokes. The architects are Messrs. Coates and Johnson, of Market Harborough.

COTTAGES AND FACTORY, SILLEY.

THE BUILDINGS are erected for Messrs. Walker, Kempson, and Stevens, Ltd., boot and shoe manufacturers. The site is a large one, rising slightly to the back, at which end the factory is built. It is on the shed principle, with north light. The roof-trusses are of wrought iron, and the whole of the roof-work is painted in white asbestos fibre roof paint, so as to lose as little light as possible. The floor is a 2in. pitch-pine floor, and the factory is fitted up with electric-lighting, water, and steam. The manager's and foremen's cottages are built 20ft. back from the front, and face the main road from Leicester. The site, being some 6ft. or 4ft. above the road, secures one of the most beautiful views of the Leicestershire hills and forest. They are built of bright red Sandstock bricks, and the woodwork is

painted white, with black timber framing. The remainder of the site is used by the workpeople for allotment gardens and recreation ground. The architect is Mr. G. Lawton Brown, of Leicester.

"BUILDING NEWS" DESIGNING CLUB: AN ARCHITECT'S HOUSE.

(For description and awards see page 377.)

CHIPS.

The Fulham Borough Council considered on Wednesday night a letter from the London County Council stating that they intended to construct a tramway from Fulham to Harlesden, and asking if the Borough Council was prepared to give its consent to it, and to contribute one-third of the cost of the necessary street widening in Fulham. The estimate of the cost of improvements and street widenings was £92,602, and it was decided that the Borough Council should give its consent to the scheme, and contribute £30,867 6s. 8d. towards the cost. The line of trams is proposed to pass through the Fulham High-street, Fulham Palace-road, Brook Green-road, and Scrubbs-lane.

Mr. J. R. Elliott, C.E., of Nottingham, has been appointed the cost of fifty guineas to prepare plan and report upon the city sewerage of Lichfield.

An inquiry was held at Middlesbrough on Tuesday by Mr. W. O. E. Meade-King into the application made by the corporation to borrow £34,100 for electric lighting extensions in the borough. An application had been granted in 1899 for £20,000, and the present one was intended to cover an excess expenditure of £13,000, and to provide £21,000 for additional plant and laying mains.

At Daubuz Moor, Truro, where a new stone viaduct is being built, a derrick three-ton crane, with its boiler, &c., fell on Tuesday from its platform to the ground, a distance of 25ft. Part of the crane struck George Matthews, a man who was working on a block of stone below, and he sustained a compound fracture of the left leg. Messrs. Reil are the contractors.

An altar cross has been executed by Mr. Frank Bell, of 11, College Green, Bristol, for All Hallows' Church, Easton. It is carved in clear, fine-grained oak, and stands nearly 5ft. in height. Mr. Bell has also two oak candlesticks, 2ft. 2½ in. in height, now in completion, designed to go with and match the cross.

Messrs. James Hill and Co., London, have recently executed an urgent order for H.M. Government for locks fitted with cast brass furniture for 488 doors in the buildings of the Bank of England. All the locks are on their patent reversible principle; one-third of the quantity are in polished brass, and the whole have been drawn from their London stock. The contractors obtained the order by competition, and were able to furnish an additional key to every lock, pack and ship the whole consignment in fourteen days from receipt of order. This fact gives some idea of the amount of stock usually held in stock at 100, Queen Victoria-street, and 2, Lambeth-hill, E.C.

Mr. H. Percy Boulnois, an inspector from the Local Government Board, held an inquiry at the Guildhall, Oswestry, on the 12th inst., concerning the application of the corporation for sanction to borrow the sum of £1,500 for the purpose of a public swimming-bath and gymnasium.

A Wesleyan chapel at Lawrence Weston was opened on Thursday in last week. The building is of red brick, relieved with Box Ground stone dressings and a tiled roof. The floor is of wood blocks. The architect is Mr. J. H. Harris, of Oswestry. The construction was carried out by Mr. H. J. Harris.

The report which spoke of engineering difficulties having cropped up in regard to the proposed tunnel beneath the Solent from Lymington to Yarmouth, Isle of Wight, is contradicted. The engineers of the scheme, Messrs. F. W. and C. S. Meik, deny that any unforeseen difficulty has arisen. As a matter of fact, the work has not yet been begun, and no insuperable trouble is anticipated. The financial outlook is also clear; but the pushing forward of the matter is deferred until the first meeting of the London and South-Western Railway Company directors after the summer vacation.

A stained-glass window dedicated to the memory of the late Trooper William Looker, Duke of Lancaster's Own Yeomany Cavalry, who died at Johannesburg, June 20, 1901, was unveiled in the south aisle of St. James's Church, Ashworth, on Sunday. The window is by Mr. A. L. Moore, of London.

A memorial obelisk to perpetuate the memory of Mr. James Bowman Lindsay, scientist, was unveiled in the Western Cemetery, Dundee, on Saturday, by Sir W. H. Preace.

WATER SUPPLY AND SANITARY MATTERS.

NEWCASTLE-UNDER-LYME.—The corporation have received a communication from the Local Government Board with reference to their new sewerage scheme. The council recently decided to spend £17,000 in the provision of an efficient system of bacteriological sewage treatment, instead of extending the irrigating area by acquiring additional land. The Local Government Board gave an intimation some time ago that they were not disposed to favour any scheme which did not include the provision of additional land. The Local Government Board have now intimated a provisional approval of the scheme, which enables the corporation to serve the statutory notices and execute other formalities. As three months' notice is required to all interested parties and authorities, it is anticipated that the new scheme will be commenced early in the new year, providing, as there is every reason, to suppose, the final sanction of the Department will be forthcoming.

Lewisham High-road Congregational Church, New Cross, London, S.E., has been renovated and decorated throughout, and the electric light installed. The stone work of the exterior has been repointed in cement, and treated with a solution of "Finate," and a new lightning conductor. The repairs and decoration have been carried out by Messrs. J. O. Dillingham, Ltd., of Brockley, under the superintendence of Messrs. Geo. Rines, F.R.I.B.A., and Reginald Palmer Davies, architects, 5, Clement's Inn, Strand, W.C., at a total cost of about £1,300.

Foundation-stones of a new Primitive Methodist Sunday-school were laid at West-lane, on Saturday. The school, which keeps the place of a wooden structure, occupies a site adjoining the chapel, and is to accommodate 400 scholars. There are an assembly-room, with gallery, 11 classrooms, infants' room, and lecture room on the ground floor, and two classrooms above. The cost of the building and furnishing is estimated at £2,500.

At St. Margaret's Church, Stoodleigh, on Thursday in last week, the Bishop of Crediton dedicated a new stained-glass window, which has been presented by Mr. J. C. Dunning, J.P., C.C., of Stoodleigh Court. This makes the eighth stained-glass window in Stoodleigh Church. The present window is intended to mark the putting down of the rebellion in South Africa, and is a tribute to the criticism of being a little more than "up-to-date."

A branch free library at Grangetown, Cardiff, was formally opened on Monday. It has cost £3,510.

A receiving order has been made in the case of John Thomas Bamby, of Leicester, builder and contractor.

The Grand Pavilion on Rhyll Pier was early on Saturday morning totally destroyed by fire. The contents included a four-manual organ, made by Bishop and Son for the Manchester Exhibition of 1887 at a cost of £2,000. The total loss is estimated at not less than £9,000, which is partially covered by insurance.

A special committee meeting of Newcastle-on-Tyne Corporation has been held relative to the appointment of a city engineer, in succession to Mr. Law, resigned. There were 55 applications from gentlemen resident in all parts of the county to fill the vacancy. A sub-committee was appointed, consisting of five members, to examine the credentials carefully and report to a future meeting of the committee in the course of the next fortnight.

The President of the French Republic arrived at Dunkirk on Tuesday, and gave a dinner, was originally proposed, in connection with the reception of the Czar, in order to formally inaugurate the new Hotel de Ville for that town. It is Finnish Renaissance in style, and has a fifty-story tower. The first floor is reached by a wide stone staircase, and the vestibule on this floor is lighted by a stained-glass window representing the entrance of Joan Bart into Dunkirk after his first victory. Between the windows on the facade there are niches containing the statues of the Dunkirk celebrities.

There were fifty-seven applicants for the post of surveyor and sanitary inspector to the Hucklebury Rural District Council, rendered vacant by the death of Mr. W. D. Bennett. Mr. J. C. Tully, of Sapcote, assisted the surveyor to the Hucklebury Urban District Council, has been elected.

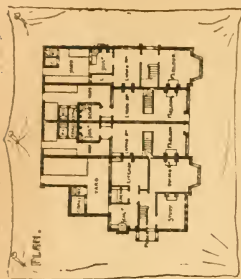
The town council of Colchester is applying to the Local Government Board for sanction to a loan of £3,555, being £2,918 for the cost of hospital extensions, and £637 for the cost of water supply and drainage recently provided.

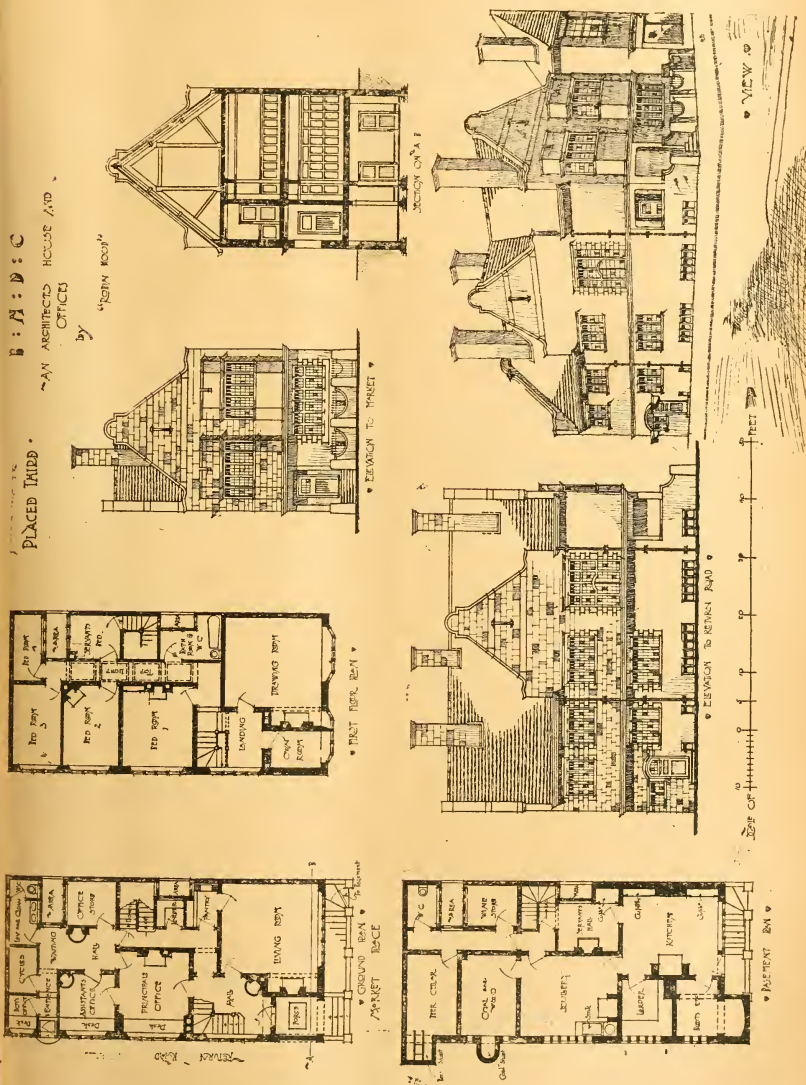
PLANNED AND BUILT BY THE COTTAGES AND FACTORY.

SILVER.

DESIGNED BY WALTER KENNEDY AND STEVENSON.

G. LAWSON, BIRMINGHAM.





Our Office Table.

Is a letter to the *Times* on the new Government Offices, Mr. Leonard Stokes, F.R.I.B.A., one of the executors of the late Mr. J. M. Brydon, offers several corrections of a statement "from a correspondent" which appeared a fortnight since. In particular he contradicts the assertion that much of the commission not yet paid would, had Brydon lived, have gone in remunerating subordinates. "Had Brydon lived," says Mr. Stokes, "every single detail about the building would have been either drawn by his own hand or under his direction and supervision, and not more than about one-tenth of the remaining commission would have gone to subordinates, for he kept but a small staff, preferring to do his own work; and here we have just the difference between a public office, like the Office of Works, and a good private office. In the former subordinates do the work, while in the latter the principal does it himself." Mr. Stokes urges the point that officials in the employ of H.M. Office of Works had not prepared details for the building so as to discredit Mr. Brydon's memory. He adds: "A good deal was at one time made of the fact that Brydon's head draughtsman had been engaged by the Office of Works to help to complete the building as Brydon would have finished it: this young gentleman is now working as a weekly draughtsman at the Office of Works, and is and others engaged in altering Brydon's design, although it would be far better for the building, its owners, the public, as well as for Brydon's memory, to have it finished by an architect of even second or third rank, than to let it fall into the hands of subordinates."

The thirty-first autumn exhibition, held in the Walker Art Gallery under the auspices of the Liverpool Corporation, was opened on Saturday, and is hardly equal to the average of recent years. There are altogether 1,703 exhibits, of which some 1,390 are pictures in oil, water, pastel, tempera, and black and white. The miniatures have 122 number; the catalogue artistic jewelry and engravings, 54; and works of sculptors, modellers, and potters, 120. The place of honour in the central gallery is accorded to the ambitious and unsatisfactory portrait of Queen Victoria by Mr. Benjamin Constant, and the same room is also the scene of the Sighting of Jerusalem, and Sargent's portrait of "General Sir Ian Hamilton," all three of which were noteworthy features of the recent display at Burlington House. One of the most attractive rooms is Gallery IX., where are hung pictures by Whistler, portraits of "Miss Alexander," Alfred Stevens, Helman Hunt, G. F. Watts, Sir George Reid, J. J. Shannon, Cayton Robinson, and Strudwick. Other works of interest are the "Acolit" of Frank Dicksee; the "Queen's Funeral" of E. Crofts; "Marianne," by J. W. Waterhouse; "Dreamland," by G. H. Boughton; "The Countess Grosvenor," by Sir W. Richmond; "The Duke of Richmond," by Professor Herkomer; "The Gleam before the Storm," by R. W. Leader; and "A Fallen Giant," by R. M. Whittier.

In connection with the work being carried out for the preservation of Stonehenge some important and interesting discoveries have been made. In April last Sir Edmund Antrobus, the owner, invited representatives of the Society of Antiquaries, the Wiltshire Archaeological Society, and the Society for the Protection of Ancient Monuments, to advise him with regard to the preservation of the stones. Amongst other things recommended was an examination of the great trilithon which overhangs the altar stone, and has been leaning at a dangerous angle ever since its foundations were weakened by the digmies made in 1620 by the Duke of Buckingham in the view of maintaining it in a position of safety. It is proposed to raise the stone into a perpendicular position, and the work is being carried out by Dr. Gwendal, Professor of Mineralogy at the Royal College of Science, and Mr. Detmar J. Blow, Sir Edmund Antrobus' professional adviser and architect. When raised the stone will be secured in a bed of concrete. Excavations for putting in the concrete have been commenced on the south-east side of the stone, and the bottom was reached at a depth of 10 ft.

Nothing more will be done than is absolutely necessary for the preservation of the trilithon. The excavations now proceeding are expected to help clear up two points upon which there has been

much speculation—namely, the age to which the monument belongs, and how the stones were squared and the mortises and tenons wrought. Dr. Gwendal has found a large number of palæolithic implements and some sarsen and syenite chippings, discoveries which suggest that the monument dates back to the stone age, and that the stones were partly, if not wholly, dressed on the spot. The tools and the stones are remarkably well formed. These are the first stone implements which have been found in the immediate vicinity of Stonehenge. When research was made in the barrows in the district sarsen stone chippings and bronze tools were found. It is probable that the stones were formed by many that the stones were created by a bronze-using people.

The London County Council have just issued, through Messrs. P. S. King and Son, a list of the streets and places within the Administrative County of London. It has been compiled by Mr. W. E. Riley, E.C.R.I.B.A., the supervising architect of the Council, which is the authority for the naming of the thoroughfares. The volume, which is arranged alphabetically, gives the name of each street and various other particulars, together with names now abolished. Mr. G. Gomme, the Clerk to the Council, writes an introduction on the historical significance of street names. "Probably," he says, "the oldest names are Billingsgate (corrupted from Belunsgate) and Ludgate, both, according to Dr. Rhys, derived from the days of the Celtic settlement in London. Of Roman London there are apparently no remains, but for Watling-street is the Saxon name given to this Roman roadway. Of Saxon London there are innumerable examples. Perhaps the most interesting is a name which was threatened with destruction in the days of the Metropolitan Board of Works, and was saved by the passing of Mr. W. J. Thoms, the antiquary, who converted the Board to the importance of preserving this name. This was Tothill-street, Westminster. Another Tothill-street occurs at the lower end of Gray's Inn-road. These names record the Toth Hill, intimately associated with the name of Toth, an old name which is already destroyed by the march of events is Wyck-street, on the site of the new street from Holborn to the Strand. This is the second syllable of the name of the Danish community which settled just outside the walls of London—namely Aldwych—and is the third syllable of the name of the Danish settlement in the Strand."

PARTICIPANTS of the educational and social work proposed to be carried on at the Northampton Institute, St. John-street-road, during the session 1901-2 are issued. The Institute is available for the use of members, associates, and students. Members are associated with a few exceptions must be between 16 and 25 years of age, but there is no limit of age as regards students. The work is divided into two main sections, an educational section for technological subjects, and a social and recreative section. The Institute forms one branch of the City Polytechnic, the other branches being the Birkbeck Institution in Bream's Buildings, Chancery-lane, and the City of London College in Moorfields. All members of the Northampton Institute are entitled to admission to the classes of the sister institutes on the same terms as the students of the sister institutes. The Northampton Institute is to provide classes in technological and trade subjects a branch of educational work scarcely touched by the sister institutes. To this end attention is paid first to the immediate requirements of Clerkenwell, the district in which the Institute stands. The studies for the forthcoming session fall into two distinct sections: the engineering day courses for students who are willing to give the whole of their time for one, two, or more years to a systematic training in one of the branches of engineering design, and the day courses for students, which are provided for the needs of those who, on account of being engaged during the day, or from any other cause are unable to devote the whole of their time to attendance at day courses. The engineering day courses are divided into three departments: mechanical engineering, electrical and electrical engineering. The sections of educational work at the institute include mechanical engineering and metal trades, artistic crafts, applied physics and electrical engineering, electro-chemistry, horology, miscellaneous trades, and domestic economy and domestic science. This study is thus afforded, under the direction of the principal Mr. R. Mulleux Wansley, aided by an efficient staff, to pursue

a course of study in every branch of technical instruction. In the day department the winter term will begin on Monday, 30th inst., and in the evening department on Monday next, the 23rd inst.

The autumnal meeting of the Auctioneers' Institute was held at Edinburgh on Thursday, Friday, and Saturday in last week. The proceedings were inaugurated on the first evening by a smoking concert at the Royal Hotel, the members of the Institute were welcomed to the city by Treasurer Cranston. At the meeting of the council, under the chairmanship of Mr. W. Bennett Rogers (London), Mr. J. A. H. Townsend Green, chairman of the Finance Committee, reported that there was a total of £2,700 invested. The Investment Fund showed a balance at the bank of £215, in addition to investments in Consols amounting to £950. The report was considered satisfactory, and adopted. The General Purposes Committee reported that the total number of members of the Institute was 1,337. A large number of applications for admission to the Institute were considered, when 18 new fellows, 15 associates, and 1 student were elected. In the evening the members and friends, numbering over 100, dined together in the Royal Hotel, Edinburgh, at the residence of Mr. Bennett Rogers, president of the chair, and he was supported on the right by Lord Dean of Guild Ormiston, Mr. J. P. Kyd (president of the Incorporated Society of Law Agents), and others. The meetings were brought to a close on Saturday. There had been the choice of two interesting excursions, one to the Forth Bridge, and the other to Roslin, to view Roslin Chapel and Castle. Both were well taken advantage of. The proceedings concluded with a luncheon at the Royal Hotel in the afternoon, given by the president.

According to the eighteenth annual report by the Board of Trade as to the operations of the Bankruptcy Act, there has been an increase of 707 in its number of cases, as compared with the returns for the previous twelve months; of £1,491,486 in the liabilities, as estimated by creditors; of £1,391,386 in the assets estimated by debtors, and unfortunately of the large sum of £283,653 in the estimated loss to creditors. The latest increase of insolvencies is in the building trade, where 155 more cases and £421,396 more liabilities than in the preceding year are recorded. Following, as this does, a large increase in the previous year over the preceding three years, it is clear that the building trade has received an abnormal and unhealthy development. The total amount of building trade liabilities reached the amount of £1,154,720. The allied trade of contractors, while furnishing a smaller number of failures, shows an increase of £150,000.

The "Canadian Trade Index" is the title of a useful publication which has been prepared by the Secretary of the Canadian Manufacturers' Association, Toronto, for the use of British, French, and Spanish importers. The "Index" contains the names of some 800 leading manufacturers of Canada, who have formed themselves into a Manufacturers' Association for the purpose of advancing the trading interests of the country. It also contains a brief sketch of the leading export manufactures of Canada. Then follows an alphabetical list of the members of the association, together with a list of the articles produced by the members. The third part contains an alphabetical list of the articles produced by the various members, under which appear the names of the manufacturers of each. The names of the articles are given in English, French, and Spanish. Mr. W. D. Scott, Commissioner of the Canadian Section, of the London Exhibition, will be glad to send a copy of this book free of charge to merchants interested in Canadian manufactures, and also offers to answer any inquiries relative to goods that may not be specified in this publication. We strongly recommend makers of building specialities to get a copy.

MESSRS. WRIGHT STEVENS AND CO., of Halifax, send us for inspection one of their patent waste water overflows for fitting inside the basin of lavatories or in baths. The waste and overflow is in one piece, and can be readily cleaned. It has only to be turned left or right to discharge or close the water. There is no connection between the overflow and grating needed, and a plain overflow is wanted. A good quick discharge is given, and the saving in cost per lavatory materials, joints, and labour is very considerable.

THE ARCHITECTURAL ASSOCIATION.

THE DAY SCHOOL will open on MONDAY, October 15th, and the EVENING SCHOOL also opens on OCTOBER 15th. A complete course of instruction and information forms for membership may be obtained upon application to the SECRETARY, at 26, Great Marlborough Street, London, W.1.

R. S. BALFOUR, Hon. Secs.
H. C. MACLE, Hon. Secs.

Trade News.

WAGES MOVEMENTS.

THE SKILLED LABOUR MARKET in August.—The monthly report by the Labour Department states that the returns for August show an increase in the percentage of unemployed compared with July, largely due to the usual seasonal decline in the building and other trades. Compared with a year ago most of the important industries show a decline. In the 142 trade unions, with an aggregate membership of 543,971, making returns, 21,025 (or 3 per cent.) were reported as unemployed at the end of August, compared with 34,414 in July and with 19,000 in the 138 unions, with a membership of 534,231, from which returns were received for August, 1900. Employment in the building trades has continued to improve. The percentage of unemployed among members among carpenters and plumbers at the end of August was 27, compared with 30 per cent. in July. The percentage for August, 1900, was 28. In the furnishing trades employment has further declined. The percentage of unemployed union members at the end of August was 35, compared with 31 per cent. in July and 30 per cent. in August of last year. Thirty-two fresh discharges, amounting to 1,500 in the 129 workpeople, of whom 6,541 were directly and 3,885 indirectly affected. Of these disputes three occurred in the building trades. Of the 10 new and old disputes, involving 11,134 workpeople, of which the majority result is reported, nine, involving 2,227 persons, were decided in favour of the workpeople; 18, involving 3,765 persons, in favour of the employers; and 11, involving 2,732 persons, compromised. The changes in rates of wages reported during August affected 103,419 workpeople, and the net effect of all the changes was a decrease averaging 5s. 2d. weekly per head. Of the total number 2,063 received advances averaging 1s. 6d. per week, and 101,254 sustained decreases averaging 5s. 2d. per week. Changes affecting 83,820 workpeople were arranged by arbitration or conciliation, and changes affecting 1,740 workpeople took effect under shifting rates.

THE bricklayers, considering themselves misled by the masters who struck work at Bath on Wednesday in last week, returned on Friday morning, and during the day the masters decided to follow their example. They began work on Saturday morning, the masters having granted them an extension of time before declaring a general lock-out. The men are now satisfied to work with the men to whom they particularly objected, he having accepted an instalment of the penalties enforced against him. They admit also that they had no objection to the demand that Messrs. Long and Sons should only employ union men in future, which they say was made inadvisably.

HULL.—In connection with the strike of slaters at Hull, a batch of operatives from Sheffield, Bradford, Leeds, and other places arrived in the city on Friday last in order to start work on jobs which the masters required completing. For several hours this was possible on account of the threatening attitude of the local men. Ultimately the strangers were set to work without any disturbance, and no further unfriendly demonstration is anticipated. About twenty or eighty men in Hull are out on strike. The National Association of Slate Merchants and Slaters having an official report with respect to the strike, in which they remark: "So convinced are the officials of the amalgamation that the Hull men are in the wrong, that they themselves have decided to come on to work, and thus set an example to others of a less determined mind, and they have asked that the Yorkshire employers shall assist them by each sparing one man at least." The Hull Building Trades Federation are supporting the men who are striking, and are offering the threatened reduction of 1d. per hour, the abolition of extra pay for overtime work at night, and other minor alterations of rules.

KIRKCALDY.—The hand-printers employed by Messrs. Barry, Oshrine, and Shepherd, bookbinders and linoleum manufacturers, Kirkcaldy, have come out on strike in consequence of the firm having stated that the men should be paid on piecework instead of day wages, as formerly.

The Secretary of the Association has sanctioned the construction of an extension of the Madras Calcimannan Railway along the west coast to Manalore, and a grant is to be made for its survey using the next cold weather.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Round Joists, Belgian.	£5 0 0 to £5 10 0	
Roller-Steel Joists, English	6 10 0	6 15 0
Wrought-iron Girder Plates	7 10 0	7 15 0
Bar Iron, good flats.	6 15 0	8 10 0
Do., Lowmoor, Flat, Round, or	20 0 0	20 0 0
Do., Welsh	5 15 0	5 17 6
Boiler Plates, Iron—		
South Staffs	10 0 0	10 0 0
Best Suedebill	12 0 0	12 0 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., 50 lbs.
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive	£13 10 0	£11 12 6
gauge	£11 5 0	£11 12 6
Best ditto.	11 5 0	12 12 6

	Per ton.	Per ton.
Cast-Iron Columns	£13 10 0	£8 10 0
Cast-Iron Stanchions	6 10 0	8 10 0
Rolled-Iron Fencing Wire	8 0 0	8 5 0
Rolled-Steel Fencing Wire	6 10 0	6 15 0
Galvanised	8 0 0	8 5 0
Cast-Iron Sash Weights	4 10 0	4 15 0
Cut Chilled Iron	13 0 0	15 0 0
Cut Floor Brads	9 10 0	9 10 0

Wire Nails (Pointe de Paris)—

	0 to 7	8 to 9	10 to 11	12 to 13	14 to 15	B.W.G.
	8 6	9 0	9 3	9 9	10 3	11 0
	11 0	11 3	12 6	13 6	13 6	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£5 15 0	to	£6 0 0
4in. to 6in.	5 12 6	"	5 17 6
7in. to 24in. (all sizes)	5 0 0	"	5 5 0

[Coated with composition, 5s. 6d. per ton extra; turned and bored joints, 5s. 6d. per ton extra.]

[Finished with composition, 5s. 0d. per ton extra; turned and bored joints, 5s. 0d. per ton extra.]

Pig Iron—

	105s. to 112s. 6d.
Cold Blast, Lilleshall	105s. to 112s. 6d.
Hot Blast, ditto	105s. to 112s. 6d.

Wrought-Iron Tubes and Fittings—Discount of Standard

	Per cwt.	Per cwt.
Gas-Tubes	70 1/2 p.	70 1/2 p.
Water-Tubes	63 "	63 "
Steam-Tubes	60 "	60 "
Galvanised Gas-Tubes	65 1/2 p.	65 1/2 p.
Galvanised Water-Tubes	52 1/2 p.	52 1/2 p.
Galvanised Steam-Tubes	47 1/2 p.	47 1/2 p.

10wt. coils. Sewt. coils.

	Per cwt.	Per cwt.
Zinc, English (London mill)	£21 15 0	to £22 15 0
Do., Vieille Montagne	25 0 0	to 25 10 0
Sheet Lead, 36. per sq. ft. super.	12 5 0	to 12 10 0
Pig Lead, in lewt. pigs	12 10 0	to 12 5 0
Lead Sheet, in 25lb. bags	15 0 0	to 15 5 0
Copper Sheets, sheathing and rods	83 0 0	to 83 10 0
Copper, British Cake and Ingot	72 0 0	to 73 0 0
Tin, Straits	115 0 0	to 115 5 0
Do., Java	120 0 0	to 120 5 0
Spelter, Silesian	17 0 0	to 17 2 6

TIMBER.

	per load	£10 0 0	to £17 0 0
Teak, Burmah	per load	£10 0 0	to £17 0 0
" Bangkok	"	10 0 0	to 15 5 0
Quebec Pine, yellow	"	3 17 6	to 4 15 0
" Ash	"	4 2 6	to 5 0 0
" Birch	"	4 0 0	to 6 0 0
" Elm	"	5 10 0	to 6 5 0
Danste and Memel Oak	"	4 5 0	to 6 0 0
Fir	"	2 10 0	to 4 10 0
Wainscot, Riga p. big	"	2 0 0	to 3 0 0
Lath, Danste, p.f.	"	4 0 0	to 5 0 0
St. Petersburg	"	4 0 0	to 6 0 0
Greenheart	"	7 15 0	to 8 0 0
Box	"	7 0 0	to 15 0 0
Sesquia, U.S.A.	"	0 1 9	to 0 2 0
Mahogany, Cuban, per super foot	"	0 0 6	to 0 0 8
lin. thick	"	0 0 6	to 0 0 8
" Honduras	"	0 0 6	to 0 0 8
" Mexican	"	0 0 6	to 0 0 8
" African	"	0 0 39	to 0 0 54
Cedar, Cuba	"	0 0 0	to 0 0 38
" Honduras	"	0 0 0	to 0 0 38
Stimwood	"	0 0 10	to 0 1 3
Walnut, American	"	0 0 3	to 0 0 8
" American (logs)	"	0 0 3	to 0 0 8

Deals, per St. Petersburg Standard, 120—12ft. by 1 1/2in.

	by 1 1/2in.	
Quebec, Pine, 1st.	£22 0 0	to £29 0 0
" 2nd	15 0 0	to 18 0 0
" 3rd	12 0 0	to 15 0 0
Canada Spruce, 1st	12 0 0	to 14 0 0
" 2nd and 3rd	8 10 0	to 10 0 0
New Brunswick	7 0 0	to 8 0 0
Riga	8 0 0	to 9 0 0
St. Petersburg	9 0 0	to 17 0 0
Swedish	10 0 0	to 20 0 0
Finland	9 0 0	to 11 0 0
White Sea	11 0 0	to 20 0 0
Baltics, all sorts	5 0 0	to 13 0 0

Flooring Boards, per square of 1in.—

	£3 11 0	to £3 17 0
1st prepared	£3 11 0	to £3 17 0
2nd ditto	0 10 0	to 0 13 0
Other qualities	0 5 0	to 0 11 0

Staves, per standard M.—

	£37 10 0	to £45 0 0
U.S. pipe	£37 10 0	to £45 0 0
Memel, or pipe	22 0 0	to 25 0 0
Memel, brack	19 0 0	to 20 0 0

STONE.

	per foot cube	£3 2 1/2
Darkey Dale, in blocks	per foot cube	£3 2 1/2
Red Mansfield ditto	"	0 2 1/2
Hard York ditto	"	0 2 1/2
Ditto ditto ditto, sawn both sides, landings,	"	0 2 1/2
random sizes	"	0 2 1/2
Ditto ditto 3in. slabs sawn two sides,	"	0 2 1/2
random sizes	"	0 1 3
Hopton-Wood (Hard Bed) in blocks, per foot cube	"	0 2 3
Ditto ditto 3in. ditto sawn both sides,	"	0 2 3
landings, random sizes	"	0 2 3
Ditto ditto 3in. ditto ditto	"	0 1 2 1/2
Portland, White Bed	per foot cube	0 2 0 1/2
Ditto Base Bed	"	0 2 1 1/2

All F.O.R. London.

OILS.

	per tun	£31 0 0	to £31 5 0
Lined	per tun	£31 0 0	to £31 5 0
Rapeseed, English pale	"	28 5 0	to 28 5 0
Do., brown	"	28 5 0	to 28 5 0
Cottonseed, refined	"	24 15 0	to 25 3 0
Olive, Spanish	"	38 0 0	to 38 0 0
Soot, pale	"	25 0 0	to 25 10 0
Cocconut, Cochin	"	31 0 0	to 31 0 0
Do., Ceylon	"	26 0 0	to 26 10 0
Palm, Lagos	"	25 0 0	to 25 10 0
Oleum	"	17 5 0	to 19 3 0
Lubricating U.S.	per gal.	0 7 0	to 0 8 0
Petroleum, refined	"	0 8 0	to 0 8 0
Tar, Stockholm	per barrel	1 6 0	to 1 6 0
Do., Archangel	"	0 19 6	to 1 0 0
Turpentine, American	per bus.	37 0 0	to 37 5 0

CHIPS.

The new electrical tram-car system at Portsmouth was started with due ceremony yesterday (Thursday). The lines were taken over by the corporation from the Provincial Tramways Company in January last, and over 2600,000 have been spent in purchase and equipment.

At the last meeting of the corporation of Chatham the town clerk reported that he had received the awards of Mr. F. W. Ruck, of Maidstone, the county surveyor, with reference to the claims of the trustees of the late Mr. George Sturja, Mr. David Kidd, and Mr. F. Baunister, for land and disturbance in connection with the improvement at the New-road arch and widening, which were as follows:—Sturja's trustees, freeholder's claim, £294; award, £223. Mr. D. Kidd, lessee's claim, £234; award, £70. Mr. F. Baunister, sub-lessee's claim, £1,108; award, £120. Totals, £2,186 and £432.

A petition is to be presented to the London County Council on behalf of the inhabitants of Grove End-road, St. John's Wood, against the scheme of the Howard de Walden Estate to erect large blocks of dwellings for the working classes.

Application having been made by the corporation of Shrewsbury to the Local Government Board for power to raise by loans the sum of £16,526 for the purpose of extending the electric light works, Mr. H. P. Boulton, an inspector, attended at the council on Friday to take evidence in respect to the application.

On Saturday the Bishop of Llandaff opened the church of St. Martin, Albany-road, Cardiff. The church will accommodate 1,000 persons, and has been erected at a cost of £10,000. Mr. F. C. Benson, of Cardiff and Hereford, was the architect.

The new park of Pottennewton, recently acquired by the Leeds Corporation from Mr. R. Benson Jovitt for £35,000, was formally opened by the Lord Mayor on Thursday in last week. The estate includes a mansion, which it has been suggested should be used as the lodgings of the Asquiths.

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ESTIMATES GIVEN ON APPLICATION.

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The most extensive Stock of every kind of wood in Planks and Boards, dry and fit for immediate use.

LIST OF COMPETITIONS OPEN

Boscomen—Cottages, limit £110 each
 Chelsea, S.W.—10 Bathing, King's-road
 Camberwell, S.E.—Baths and Wash-rooms, Old Kent-road
 A. Saxby Snell, F.R.I.B.A., Architect
 London, N.W.—Hearts of Oak Society's New Offices, &c.
 Euston-road, limit £3,000
 Walton-on-Thames—Municipal Hall, Fire Station, &c.
 Cardiff—Chapel, Cathedral-road, cost £2,000
 Middlesbrough—Misson Hall, School, and Classrooms

T. J. O'Keefe, Clerk, Boscomen
 The Public Works Committee Office, 171, King's-road, Chelsea, S.W. Oct. 1
 The Town Clerk, Town Hall, Camberwell, S.E. Sept. 21
 Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, Adelphi, W.C. Nov. 15
 P. H. Webb, U.D.C., Clerk, Walton-on-Thames
 Thomas Evans, 101, St. John's-street, Cardiff
 W. H. Meggsen, Woodlands-road, Middlesbrough

LIST OF TENDERS OPEN.

BUILDINGS.

Dorchester—Repairs, 9, 10, 11, 12, Princess-st., & 1, West-walk
 Aveland, Kent—Additions to Henry-road Board Schools
 Fife—Alterations to Farm Offices
 Kirk-cald—Additional Store to Buildings
 Bedford—Rebuilding Infirmary Ward at Workhouse
 North Waltham, N.B.—House and shop
 Ruff—Boiler-house at Luddbridge Asylum
 Haverhill—New Premises
 Acre—Rebuilding—Repairing Llanfistyn Brewery
 Dreville—Alterations—Alterations to Farm Offices
 Mynachlog—Schoolroom
 Ince—Public Offices &c.
 Eddi—Additions to School
 Burnaby—Extension of Imperial Hotel
 Watley Thorns—Schools 235 places
 Esherbury, S.E.—Pulling Down Houses
 Newnham—Village
 Sunderland—School, Sanson-street
 Faversham—Additions to Property, Short-street
 Tyldesley—Shed at Gasworks
 Newcastle-under-Lyme—Staircases, &c., at Workhouse
 Leeds—Alterations to Meadow-lane Gasworks
 Waltham—Cookery-Room, &c., Wood-street School
 Norham—Villa
 Belfast—Dining Hall at Workhouse
 Castelford—Houses, Gloucester-st.
 Brighton—Alterations to Reading-Room
 Bromley-by-Low—Additions to Mortuary at Sick Asylum
 Worley—Lodge
 Cardiff—Laundry and Carpet-Beating Works
 Treaw—Thirty Cottages
 Wilsden, N.W.—Generating Station, &c.
 Eyld Broughton—Village
 Nottingham—Rebuilding Dog and Partridge Inn
 Werneth—Cotton Shed
 Upworthy, Carlisle—Primitive Methodist Church
 Cockerthorpe—Altering House
 Gressenhall—Alterations, &c., at Workhouse
 Carlisle—Two Houses, &c., at Workhouse
 Ixorton—Infectious Diseases Hospital
 Wigan—Coal Stage
 Ballymore—Dry-dock Chamber, &c., at Workhouse
 Stairfoot—Five Cottages, Stanley-road
 Rainhill—Alterations to Laundry, &c.
 Barry Port—School, &c.
 Pollen—Forty-four Houses
 Whitstable—Coastguard Buildings
 Kilbride—Church Restoration
 Wainfield—Six Cottages
 Leicester—Compartment Room, Bismarck Baths
 Blackpool—Additions to Destructive Works
 Fife—Fifteen Cottages
 Castledale—Town and Spire to Roman Catholic Church
 Macclesfield—Schools
 Wombwell—Village
 Carlisle—Four Houses, Cornfield Gardens, Warwick-road
 Bristol—Infants' School, Wilson-gate
 Leeds—Club, Sussex-street
 Runcorn—Twenty-two Houses for the Working Classes
 Carlisle—Two Houses, Close-street
 Wilton, N.E.—North-East London Institute
 Wombwell—Six Houses
 Stafford—Electrical Engineering Works
 Wendon—Isolation Hospital
 Glasgow—Reconstructing Buildings, Union-street
 Wombwell—Four Houses
 Carrickfergus—Repair of Houses
 Sturtevant—Workhouse, &c.
 Plymouth—Salisbury-road Schools
 Calverton—House, Barrington-road
 Windsor—Workshop
 Clacton, Yarmouth—Cemetery Chapel
 Bournemouth—School (400 places)
 Rushden—Fire Station
 Glasgow—Additions to Barnhill Posthouse
 Exon—Electricity Buildings, &c., Chimney
 Brynmawr, Wales—Boys' School (200 places)
 Ebbw Vale—Reception House
 Leamington—Casualty Buildings
 Carrickfergus—Gatehouse at Cemetery
 Tyn-y-bryn—Additions to Police Station
 Cardiff—Mortuary and Burial at Cemetery
 Bournemouth—Central Schools, Oxford-street
 Bolton—Generating Station
 Tooting—20 Cottages, Drawings for Working Classes
 Salford—Additions to Workhouse
 Barking—Barrington (General Entrance Lodge, Longridge-road)
 Barking—Hospital, Longridge-road
 Barking—Police Station
 Chesham—Town Hall
 Woking—Eight Shops and Fifteen Two-story Flats
 Ingar—Villa
 Farnham—Additions to House
 Havant, near Havre—Nine Houses
 Nottingham—Two Pairs of Villas, Park-avenue
 Castelford—Two 800-1000-lb. Villas, Barnwood-road
 Newcastle-on-Tyne—Additions to Co-operative Stores
 Barnaby—Chimney, &c., 190 ft. high
 Newbury—Enlargement of Workhouse, Castle Foregate
 North Broughton—Additions to Red Lion Inn
 Landaff, N.W.—Hill, &c., and Shop Premises
 Llanfair—Nine Houses
 Luton—Blowing and Work-shops, Manchester-street

1000s. (merged), 500s., 500s.
 1500s., 700s., 500s.
 1000 merged, £75, £50
 £20, £20, £10, £10

Municipal Charities Trustees
 School Board
 Brewery Co., Ltd.
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 School Board
 Urban District Council
 School Board
 Bolsover School Board
 Kermansley Borough Council
 W. D. Clegg
 School Board
 C. Walker
 Tyldesley—with Shakerley U.D.C.
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 Gas Committee
 School Board
 Guardians
 J. Terry
 Poplar & Stepney Asylum Managers
 Earl of Warnecliffe
 New Century Building Club
 District Council
 Joint Station Committee
 Lancashire & Yorkshire Railway Co.
 Urban District Council
 Milford & Llanidloes Union Guardians
 Joint Hospital Board
 Lancashire & Yorkshire Railway Co.
 Guardians
 Lancashire Asylums Board
 Penryn School Board
 Admiralty
 Baths Committee
 Planning Committee
 Brumby and Frodingham U.D.C.
 School Board
 G. A. Hollin
 School Board
 East Ward Unionist Association
 Heslon and Isleworth U.D.C.
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 Caledonian Railway Co.
 J. Carr
 Shields' Institution Governors
 Leaden and Winstree Guardians
 School Board
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 Royal Gaslight Co.
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 School Board
 Urban District Council
 Parish Council
 Corporation
 School Board
 Woolwich Borough Council
 Municipality
 Urban District Council
 Corporation
 Chesham and Watley U.D.C.
 School Board
 Electricity Committee
 London County Council
 King's Norton Union Guardians
 Urban District Council
 Urban District Council
 Corporation
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 Jas. Kershaw
 Industrial Co-operative Society
 E. Parry and Son
 T. Swales

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 B. J. Francis, Architect, Aberystwyth
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 Davidson and Garsden, 12, Doe-street, Aberdeen
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 Vallance and Webster, Architects, Mansfield
 The Borough Surveyors, Nottingham
 Alex. Mackenzie, Architect, Kingston, N.B.
 T. W. Bryers, Clerk, Sunderland
 W. Head, Architect, Newcastle, Newcastle-on-Tyne
 The Engineer, Gasworks, Tyldesley, Lancs.
 Chapman and Snape, Architects, Newcastle-under-Lyme
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 Start and Howell, Architects, Colchester
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 G. A. Wilson, Architect, Hatfield Chambers, Sheffield
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 Arthur G. Evans, Architect, Pontypridd, Cardiff
 O. Claude Robson, M.I.C.E., Eng. Public Offices, Dymchurch, Kilburn
 Austin and Paley, Architects, Castle Park, Lancaster
 G. S. Holt, London, &c., Nottingham
 The Engineer's Office, Hunt's Bank, Manchester
 Son and Sons, Painters, Rotherham
 John Fearon, Clerk, Colchester
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 A. Paul MacAlister, Architect, 20, St. Andrew-street, Cambridge
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 The Director of Works Dept., 21, Northumberland-avenue, W.C.
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 P. Chapman, Wainfield, Wales
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 D. J. Cooke, Architect, Cork
 J. Cooke, Esq., Architects, 2, Thomas Chambers, North, Wales
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 Briggs Bros., Market-street, Carlisle
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 Siemens Bros. and Co., Ltd., Woolwich, Kent
 Blackwell and Thomson, Architects, Leicester
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 John Robinson, Architect, Park Cottage, Wombwell
 The Superintendent, Carrickfergus
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 H. J. Sully, Architect, 11, The Crescent, Plymouth
 J. Penne, Cornmouth, Cornwall
 H. H. Foulds, Architect, 20, St. Andrew-street, Cambridge
 J. W. Cucklin, Borough Surveyor, Town Hall, Great Yarmouth
 S. J. Adams, Architect, Weston Chambers, Weston-road, Southend
 W. B. Martin, Esq., Town Surveyor, Vestry Hall, Rushden
 MacWhannell and Rogers, Architects, 50, West Regent-st., Glasgow
 Lacey, Cleregh, and Sillar, Engineers, 2, Queen Anne's-terrace, S.W.
 Frank Sumner, Borough Engineer, Maxey-road, Farnham
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 J. Earnshaw, M.S.A., Architect, Bridlington
 Arthur Andrew, Gas and Water Offices, Oldham
 The Borough Engineer, Farnham
 J. S. Tall, Mail East, S.W.
 Whitwell and Sons, Architects, Birmingham
 C. F. Dawson, Public Offices, Barking, Essex
 Robert Williams, Esq., Engineer, 2, Victoria-square, Glasgow
 Frank Whitmore, Architect, Chelmsford
 Walter and Son, Architects, 17, College-green, Gloucester
 J. R. and E. E. Pearson, Architects, 27, Castle-street, Edinburgh
 R. G. Kestin, 1, Colindale, Barnes, N.W.
 Hedley J. Price, A.R.I.B.A., 21, Low-pavement, Nottingham
 Garsden and Pennington, Architects, Wesley-street, Castelford
 J. E. Davidson, Architect, Newcastle-on-Tyne
 The Barnsley Road and By-Pass Co., Ltd., South Shields, Barnsley
 A. H. and A. S. Davidson, Architects, 10, St. John's-street, Shrewsbury
 Richard Hall, Architect, Bangor
 R. G. Kestin, 1, Colindale, Barnes, N.W.
 A. Wilkinson, Architect, 81, Inkerman-street, Luton

BUILDINGS—continued.

York—Primitive Methodist Church and Schools, Monk-lane
Llanfairfawc, N. W.—House and Shop Premises
Bishop—Residence
Edinburgh—School, &c.
Edgware—House, Canon's Park Estate
Ware—House
Rush—Post-train—House and Shop
Pontefract—Business Premises, Market-place
Worborough Dale— Wesleyan Reform Chapel and School
Clupted, Surrey—Residence

Alfred Knighton
Bent Ley Silk Mills, Ltd.
A. L. Ashwell
J. Blackburn

Fredk. W. Dixon, Architect, Trelvelan Buildings, Manchester
Richard Hall, Architect, Bangor
James Young and Co., Architects, 63, Market-street, Bradford
William Carter, Station-street, Midham
R. M. Lawson, Architect, 40, Broadway, Ealing, W.
R. and A. G. Thorogood, Surveyors, Hertford
Garside and Pennington, Architects, Toplegate, Pontefract
Tennant and Bagley, Architects, Ropergate Chambers, Pontefract
George Moxon, Architect, 20, Church-street, Barnsley
H. G. Gribble, Architect, Star Hill, Woking

ELECTRICAL PLANT.

Maidenhead—Electric Lighting Plant
Bathmore—Re-Lamp Carbons (One Year)
Salford—Wiring Electric Car Depot
Glasgow—Cables
Edinburgh—Arambank Electric Lighting Station
Hull—Dynamos, &c.
Doncaster—Steam Dynamo (220kw.)
Sheffield—Plant
Huddersfield—Generating Plant
Rochdale—Feeder and Distributor Cables
Loughborough Junction, S.E.—Continuous-Current Plant, &c.
Leeds—Main Switchboard
Greenwich Tunnel—Electric Lifts, &c.
Barnsley—Forty-Are Lamp Canopies
Broompark—Electric Light Fittings
Blackpool—Are Lamps, &c.

Corporation
Urban District Council
Tramways Committee
Corporation
Urban District Council
Corporation
Corporation
Corporation
Electricity Committee
London County Council
Broom Parish Council
Corporation

Bursall & Monkhouse, Engrs., 14, Old Queen-st., Westminster, S.W. Sept. 23
E. P. Foxwell, Civil Engineer, Town Hall, Dublin
The General Manager, Tramways Office, Town Hall, Salford
John Young, General Manager, 88, Renfield-street, Glasgow
R. F. Freck, Electrical Engineer, 10, Broadway, Bristol
A. E. White, City Engineer, Town Hall, Hull
C. A. L. Peussan, Borough Eng., Grev Friar-road, Doncaster
E. E. Fadden, General Manager, Corporation, Sheffield
The Borough Electrical Engineer, St. Andrew's-road, Huddersfield
C. C. Atchison, Borough Eng., Eng. Works, Don-st., Rochdale
The Engineer's Department, County Hall, Spring Gardens, S.W.
Harold Dickinson, Manager, Whitehall-road, Leeds
The Engineer's Department, County Hall, Spring Gardens, S.W.
R. C. Quinn, Borough Electrical Engineer, Blackpool
John Bradley, Clerk, Broompark, near Durham
R. C. Quinn, Borough Electrical Engineer, Blackpool

ENGINEERING.

Buxton—Additions to Gasworks
Green—Hydraulic Plant
Netherland, N.B.—Dun
Portland—Service Reservoir
Salford—Water Supply to Car Depot
Andover—Waterworks
Owlsey, S.E.—Boiler at Baths
Manchester—Concrete Foundations
Sunderland—Steel Girder Bridge
Denby—Storage Reservoir
Leeds—Winding Trolleys, &c.
Bury, Lancs—Refrigerating, &c., Plant
Harna—Sewerage System
Lancashire—Two Centrifugal Pumping-Engines
Bale—Waterworks (9 miles of pipes)
Huddersfield—Timber Sluice
Manchester—Concrete Foundations for Engine-Beds
Way—Water Main (70 yards)
Lancashire—Water Main (10-ton)
30-ton—Docks
Edinburgh—Laying Cast-Iron Pipes (2,320 yards of 33in.)
Manchester—Hydraulic Flack-making Plant
Lancashire—Water Main (5,600 yards)
Edinburgh—Additional Settling Ponds
Manchester—Water Main (10-ton)
Lancashire—Water and Drainage Works
Manchester—Pumping Machinery
Manchester—The Ford of Marston
Manchester—Laying Electric Light Cables and Mains
Manchester—Turnbuckles
Manchester—Pumping Plant
Manchester—Well, &c.
Manchester—Pumping Main (21 miles)
Manchester—S.W.—Reconstructing Tramway Routes
Manchester—Engineering Works, Halfway-street
Manchester—Reconstruction of Rossdale Pier
Manchester—Batteries, &c.
Manchester—Two Incinerators
Manchester—South Works—Harbour Bridge
Manchester—Two Bridges over the Nere
Manchester—Main, &c.

Gas Committee
Guardians
Urban District Council
Tramways Committee
Canterbury Baths Committee
Gas Committee
Parish Council
Corporation
Health Committee
Sanitary Committee
Stratton and Bude Urb. Dist. Council
Health Committee
Electric Lighting Committee
Electricity Committee
General Purposes Committee
Rural District Council
Corporation
Urban District Council
Llangrinhell Rural District Council
Brazilian Minister of Industry
Water Trustees
Urban District Council
Municipality
East Preston Rural District Council
Rural District Council
Urban District Council
Water Trustees
Danish Ministry for Public Works
District Committee
Corporation
Urban District Council for Public Works
Urban District Council
Norwegian State Railways
Urban District Council
Water Board
Urban District Council
Council
School Board
London County Council
Greenwich Urban Guardians
Fishguard and Rossdale Railway Co.
Down County Council
Corporation
New South Wales Government
Municipality
Urban District Council

Harold Barker, Gas Engineer, Town Hall, Buxton
Brid E. J. Sheehy, C.E., 50, George-street, Limerick
Davidson and Gair, 12, Darnley-st., Aberdeen
E. J. Elford, C.E., M.I.M.E., Eng. Council Offices, New-st., Portland
The General Manager, Tramways Office, Town Hall, Salford
R. Water Knapp, Surveyor, Town Hall, Andover
W. Oxley, Borough Engineer, Town Hall, Canterbury, S.E.
David Terrace, Manager Gasworks, Middlebrough
E. Lines, Civil Engineer, Union Offices, Chesterfield
Kyle and Frew, Engineers, 110, West George-street, Glasgow
F. Harper, M.I.C.E., Borough Engineer, Town Hall, Cardiff
Archibald Noll, Architect, 18, Cockridge-street, Leeds
W. J. Barden, Chief Engineer, City of Havana
Frank Baker, Borough Engineer, Municipal Buildings, Middlebrough
B. Latham, M.I.C.E., Parliament Mansions, Victoria-st., S.W.
The Borough Engineer, Town Hall, Gateshead
A. S. Hill, City Electrical Engineer, 10, Copthorne, Hull
C. S. Allott and Sons, Engineers, 46, Brown-street, Manchester
The Borough Engineer's Office, Town Hall, Conway
W. H. Stinson, C.E., Corridor Chambers, Market-place, Leicester
John Bowen, A.M.I.C.E., Borough Engineer, Town Hall, Reading
A. Scott Cartwright, Surveyor, Council Offices, Wilmsho
E. B. Halyard, C.E., Alexandria-road, S.W.
The Commercial Dept. of the Foreign Office, Whitehall, S.W.
W. A. Tait, Engineer, 72, George-street, Edinburgh
The Engineer's Office, Town Hall, Huddersfield
Taylor, Sons, & Santo Crimp, M.I.C.E., 27, Gt. George-street, S.W.
H. Bartlett, Surveyor, Railway-approach, Woking
Fredk. Ryall, Town Clerk, Town Hall, Ipswich, S.E.
F. Massie, A.M.I.C.E., Council Offices, Salford, Wakefield
W. A. Tait, Engineer, 72, George-street, Edinburgh
James Macdonald, Revolver-maker, 10, Copthorne, Oct.
James Barron, M.I.C.E., 1, Bon Accord-street, Aberdeen
E. G. Mawley, M.I.C.E., Borough Engineer, Town Hall, Leicester
The Engineer's Department, Corporation, 10, Copthorne
W. E. Foster, Clerk, Council Offices, Aldershot
The Commercial Department of the Foreign Office, Whitehall, S.W.
H. S. T. Town Office, Liphinstown
Richard Collier, Surveyor, Court House, Enfield
G. and F. W. Holson, Engineers, Loughborough
H. Brown, Messrs., &c., Town Hall, Newry
J. S. Barnhill, C.E., 11, Strand, London
J. Earnshaw, M.S.A., Architect, Bridlington
The Engineer's Department, County Hall, Spring-gardens, S.W.
Thomas David, F.R.I.B.A., 12, Croome Hill, Greenwich, S.E.
J. O'Leary, Engineer, Inchicore, Dublin
The Court House, Surveyors, Downpatrick
Fred. Gainsford, Engineer, Calcutta
The Agent-General for New South Wales, 9, Victoria-street, S.W.
The Municipal Council, St. Peterburg
N. H. Humphrys, Gas Engineer, Salisbury

FENCING AND WALLS.

Manchester—Boundary Wall and Fences
Over Sydneyham, S.E.—Wall at Home Park
Manchester—S.E.—Fence
Harna—Cemetery Fencing
Edinburgh—Upper-Mare—Boundary Walls to School
Manchester—Cemetery Wall

Guardians
Lewisham Borough Council
Borough Council
Urban District Council
School Board
Urban District Council

Ashton Vesil, Architect, Wolverhampton
The Surveyor, Town Hall, Catford
The Surveyor, Town Hall, Catford
W. G. Warburton, Surveyor, Public Rooms, Horncastle
Hans F. Price, Architect, Weston-super-Mare
W. D. E. Tugart, C.E., 17A, Donegall-street, Belfast

FURNITURE AND FITTINGS.

Edinburgh—Kitchen Fittings, Joyce Green Hospital
Edinburgh—200 Buff Hollock Blinds, Workhouse Infirmary
Edinburgh—Furniture and Bedding
Edinburgh—Furnishing Mixed and Infant Schools

Metropolitan Asylums Board
London County Council
Standing Joint Committee
School Board
Finance Committee
Corporation
G. Walker
West Ham Corporation
J. Terry
Guardians
Guardians
East Ward Unionist Association
Burnal Board
Carlisle Burial Joint Committee
Birkenhead Industrial Society

A. and G. Barton, Architects, 15, Lendenhall-street, E.C.
David E. Brindley, Clerk, Workhouse Infirmary
The Chief Constable's Office, Canton, Cardiff
J. Earnshaw, M.S.A., Architect, Bridlington
The City Valuer, Council House, Bristol
J. Davidson, 3, Station-road, Newburn
H. B. Debenham, Town Clerk, St. Albans
B. J. Francis, Architect, Lion-street, Abergeveny
W. Reid, Architect, Salmon-square, Farnborough
The Engineer's Office, Town Hall, West Ham, E.
Garside and Pennington, Architects, Wesley-street, Castledale
Wade and Turner, Architects, 10, Pitt-street, Barnsley
John Cotton, Clerk, Cork
Alfred Hawes, Clerk, Union Offices, Bakewell
T. Winn and Sons, Architects, 92, Albion-street, Leeds
H. W. Hannard and Rogers, Architects, 20, West Regent-st., Glasgow
W. B. Jack, Architect, 39, Lotherwell-street, Carlisle
W. Outwaite, Secretary, Birkenhead

PLUMBING AND GLAZING.

Edinburgh—Water Closet Accommodation
Wokingham—Villa
Harna—Barnhill Porchouse
Manchester—Business Premises, Market-place

Corporation
W. D. Clerg
Parish Council
J. Blackburn

The Borough Engineer's Office, Bootle
Alex. Macdonald, Architect, Kingsmead, N.B.
W. Hannard and Rogers, Architects, 20, West Regent-st., Glasgow
Tennant and Bagley, Architects, Ropergate Chambers, Pontefract

ROADS AND STREETS.

Edinburgh—Furnishing Lovers' Walk
Edinburgh—New Road, Castle Field
Edinburgh—Thames—Fencing and Flagging Old Mill-lane
Edinburgh—Fencing Chapel-street
Edinburgh—Private Improvement Works

Urban District Council
Corporation
Corporation
Corporation
Corporation

O. H. Jack, C.E., F.G.S., Engineer, Council House, Aston
Fred. T. Clayton, Borough Engineer, Market Hall, Redhill
The Borough Engineer, Clutton House, Clutton, Bath
James Paton, Borough Engineer, Municipal Offices, Plymouth
The Borough Engineer's Office, Bootle

ROADS AND STREETS—continued.

Tottenham—Making-up Three Roads	Urban District Council	W. H. Prescott, A.M.I.C.E., Engineer, 712, High-road, Tottenham	Sept. 21
Moffat—Alteration of Roadway, &c.	Joint Bridge Committee	Wm. Tait, Town Clerk, Moffat	" 24
Bridley Hill—Making-up Victoria-road	Urban District Council	John Yorke, Town Hall, Bridley Hill	" 24
Tottenham—Kerling, Channelling, &c., St. Ann's-road	Urban District Council	W. H. Prescott, A.M.I.C.E., Engineer, 712, High-road, Tottenham	" 24
West Ham, E.—Making-up Streets	Urban District Council	W. J. Jones, Surveyor, Council Offices, Redcliffe	" 24
St. Albans—Street Works	Corporation	The City Surveyor, Victoria-street, St. Albans	" 24
Middleborough—Paving Carriage-ways, 21,000 square yards	Streets Committee	F. Baker, C.E., F.O.S., Borough Engineer, Municipal Buildings, Middleborough	" 25
Wood Green, N.—Making-up Roads	Urban District Council	J. G. Guyon, A.M.I.C.E., Engineer, Town Hall, Wood Green, N.	" 25
Moss Side—Paving, &c.	Urban District Council	Henry B. Longley, Engineer, Council Offices, Moss Side, Lancs.	" 25
Tunbridge Wells—Street Works	Town Council	W. H. Maxwell, A.M.I.C.E., Borough Surveyor, Town Hall, Tunbridge Wells	" 26
Hull—Paving Stone-ways	Corporation	A. White, City Engineer, Town Hall, Hull	" 26
Widlington, Lancs.—Street Works	Urban District Council	A. H. Mountain, A.M.I.C.E., Engineer, Town Hall, West Didsbury	" 26
Preston—Footways, &c.	Rhonda U.D.C.	W. J. Jones, Surveyor, Council Offices, Pontre	" 27
Muswell Hill—New Pavement	Urban District Council	W. J. Jones, Surveyor, Council Offices, Redcliffe	" 27
Witham—Stone Paving at Chipping Hill	Urban District Council	W. P. Perkins, Surveyor, Witham	" 28
Chertsey—Footways	Urban District Council	M. Hobson, Surveyor, Council Offices, Eley	" 30
Penny S.E.—Private Street Works, Tremaine-road	Urban District Council	Robert W. Longley, Engineer, 14, Abberley, S.E.	" 30
Ellynton, Folkestone—Widening Hishorlow-lane	Kent County Council	F. W. Luck, County Surveyor, 38, West-street, Maidstone	" 30
Netherwell—Paving, 4,000 yards	Town Council	M. S. Millan, C.E., Croydon, Laminating	" 30
Harlow—Paving Main Road Footpaths	Middlesex County Council	W. Waklam, County Engineer, Guildhall, Westminster, S.W.	Oct. 1
Eltham—Kerling and Channelling	Middlesex County Council	H. T. Waklam, County Engineer, Guildhall, Westminster, S.W.	" 1
Sunderland—Roads, &c.	Corporation	The Borough Engineer, Town Hall, Sunderland	" 2
Castleford—Improvement Works, Bank-street	Urban District Council	J. Green, Surveyor, Castleford	" 3
Johannesburg—Asphalt Pavement	Urban District Council	Lionel Curtis, Acting Town Clerk, Johannesburg	Nov. 30
Skipton—Kerbing, &c.	Urban District Council	W. H. Hutchinson, Holme Cottage, Embsay, Skipton	" 30

SANITARY.

Bolton—Sewer, &c.	Urban District Council	Samuel Knight, Clerk, Council Offices, Bolton	Sept. 21
Redcliffe—Two Urinals	Urban District Council	W. J. Jones, Surveyor, Council Offices, Redcliffe	" 25
Pennyworth—Sewers, &c.	Rhonda Urban District Council	Walter R. Evans, Architect, Old Bank Chambers, Pontypridd	" 25
Forest Gate, E.—Underground Conveyance, Sebert-road	West Ham Corporation	The Borough Engineer, Office, Town Hall, West Ham, E.	" 24
Pontre-Sewers, &c.	Rhoda Urban District Council	W. J. Jones, Surveyor, Council Offices, Redcliffe	" 24
Whitehaven—Sewers, &c.	District Council	Geo. Boyd, C.E., 33, Queen-street, Whitehaven	" 24
Willesden, N.W.—Fly Drain (16in. at 1,613ft.), Acton-lane	Rural District Council	O. Claude Robson, M.I.C.E., Dyse-road, Kilburn, N.W.	" 24
Hallaton—Sewerage	Rural District Council	Charles & Johnson, Engineers, 4, Market-street, Harborough	" 24
Gateshead—Draining Ball-cell Caisson	Emergency Committee	J. Bower, C.E., Borough Surveyor, Town Hall, Gateshead	" 25
Hilp—Sewers, &c.	Corporation	W. Edson, City Surveyor, Town Hall, Hilp	" 25
Ashey-under-Lyne—Water-Carriage Conveyance	Corporation	W. J. Barnshaw, M.I.C.E., Town Hall, Ashton-in-Lyne	" 25
Marlborough—Sewers, &c.	Town Council	E. Llewellyn Gwiliam, Town Clerk, Marlborough	" 25
Hampton Wick—Sewerage-Water Drainage	Urban District Council	Harold Fawcett, Clerk, High-street, Hampton Wick	" 27
Barnesley—Sewers, &c.	Rural District Council	Walter J. Lomas, Engineer, 15, Alder-street, Bolton	" 27
Hale—Sewers, &c.	Urban District Council	Frank J. Hould, A.M.I.C.E., F.O.S., Forest-road, Hale, Cheshire	" 30
Wharfedale—Sewer	Urban District Council	John McGregor, Engineer, Spooner-street, Bradford	" 30
Radcliffe—Sewers, &c.	Urban District Council	W. L. Radwell, Surveyor, Council Offices, Radcliffe	" 30
Millwall—Sewer, &c.	Urban District Council	James Diggle, Civil Eng., Hind Hill-st., Heywood, Lancashire	" 30
Tringford-on-Avon—Sewers	Urban District Council	W. J. Brown, Surveyor, Council Offices, Tringford-on-Avon	Oct. 1
Dover—Sewers, Bridge-street and Granville-street	Town Council	Henry E. Stigson, A.M.I.C.E., Borough Eng., Town Hall, Dover	" 1
Barham, Suffolk—Drainage of Workhouse	Bosmere & Claydon Union Guardians	H. Miller, C.E., 16, Museum-street, Ipswich	" 2
Bidford—Sewerage	London County Council	E. Lorton, M.I.C.E., Engineer, 15, Victoria-street, S.W.	" 2
Erith—Low and High Level Sewers	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 8

STEEL AND IRON.

Buxton—Cast-Iron Mains and Specials	Gas Committee	Harold Barker, Gas Engineer, Town Hall, Buxton	Sept. 21
Tydesley—Iron Shed	Urban District Council	Wm. J. Matthews, Clerk, Council Offices, Tydesley	" 23
Whitton, Essex—Cast-Iron Tank at Bridge School	Metropolitan Asylum Board	T. Beaumont, Asst. Clerk, Council Offices, Tottenham	" 23
Manchester—Steelwork, &c.	Electricity Committee	C. S. Alford and Sons, Engineers, 40, Brown-street, Manchester	" 23
London—Steel Stanchions, Girders, &c. (260 tons)	City Council	Rushdon, Proctor, and Co., Sheet Iron Works, Lincoln	" 28
Nottingham—Fluents (100 tons)	Urban District Council	Robert Brown, M.I.C.E., Bridge-street, Salisbury	" 30
Sandal Magna—Cast-Iron Pipes	Urban District Council	F. Massie, A.M.I.C.E., Council Offices, Sandal, Wakefield	" 30
Nottingham—Steel Girders (200 tons)	City Council	Arthur Brown, M.I.C.E., City Engineer, Nottingham	Oct. 1
India Office, S.W.—Wales, Axles, Crossings, Striches, &c.	Secretary of State for India	W. J. Jones, Surveyor, Council Offices, Redcliffe	" 1
Alexandria—Moorings Chains	Fennythorpe Rural District Council	The Controller-General of Ports and Lighthouses, Alexandria	" 1
Blackmill, Bridging—Steelwork for Bridge	Urban District Council	H. Dawkins Williams, C.E., Blackmill, Bridgend, South Wales	" 1
Salford—Steel Girders and Coal Hoop, Albion-street	Urban District Council	W. J. Jones, Surveyor, Council Offices, Redcliffe	" 1
London, S.W.—Silt Rafts, &c.	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 8
London, S.W.—Track Rails, &c.	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 8
London, S.W.—Steel, 25 tons, Fishplates (450 tons)	London County Council	The Agent-General for Victoria, 14, Victoria-street, S.W.	Nov. 11

STORES.

Harrow—Broken Granite (1,600 tons of 1 1/2 in.)	Urban District Council	J. Percy Bonadett, Surveyor, Harrow	Sept. 21
St. Pancras, N.W.—River Sand (Six Months)	Public Works Committee	W. Nisbet Blair, M.I.C.E., Borough Eng., Town Hall, Pancras-rd, N.W.	" 23
Guildford—Blue Gneiss Granite (1,000 tons)	Town Council	C. G. Mason, C.E., Borough Surveyor, Tuns-gate, Guildford	" 23
Wilton—Flints and Gravel (One Year)	Rural District Council	John Goulden, District Surveyor, Wilton	" 24
Amesbury—Flints (One Year)	Rural District Council	R. A. Wilson, Clerk, Bridge-street, Salisbury	" 24
Hatton—Bulking Materials (One Year)	County Lunatic Asylum Visitors	The Clerk to County Lunatic Asylum Visitors, Hatton, nr. Warwick	" 25
Hilp—Lead Pipes (2 in., about 100 tons)	Corporation	W. Edson, City Surveyor, Hilp	" 25
London, E.C.—Sisal Fittings, &c.	East Indian Railway Co.	Octavius Thomas, Gen. Office, Fenchurch, E.C.	" 25
Haslemere—Blue Imperial Granite (400 tons)	Town Council	George Tipton, Borough Surveyor, Basingstoke	" 26
Pontre—Lead Pipes, Fittings, &c. (Half Year)	Rhoda Urban District Council	W. J. Jones, Surveyor, Council Offices, Redcliffe	" 26
Boltonton—Blue Broken Stone (200 tons)	Urban District Council	J. J. Berry, Secretary, Cophall House, Cophall-avenue, E.C.	" 26
Whitton, Durham—Road Materials (Six Months)	Urban District Council	Thomas Lambert, Clerk, Town Hall, Gateshead	" 26
London, E.C.—Telegraph Poles	Postmaster-General	C. E. Stuart, Controller of Stores, General Post Office, E.C.	" 30
Hendon—Stone—Granite Sills (100 tons)	Urban District Council	Wm. Hodgson, Clerk, Council Offices, Hendon Moor, Stockport	" 30
Puddington, W.—Stone—Granite (200 cubic yards)	Borough Council	Wm. Hodgson, Clerk, Council Offices, Hendon Moor, Stockport	" 30
Aldeburgh—Gravel (2,000 tons)	Urban District Council	Nelson P. Dennis, A.M.I.C.E., Surveyor, Aldeburgh	Oct. 1
Embsay—Gravel—Road (400 tons)	Urban District Council	Alfred Homfray, Clerk, Cradley Heath	" 8
London, S.W.—Lime (22,000 tons), at Outfall Works	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 8
London, S.W.—Gravel-splashed of Iron (3,700 tons)	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 8
Johannesburg—Wood Pavement Blocks (27,450)	Urban District Council	Lionel Curtis, Acting Town Clerk, Johannesburg	Nov. 30

CHIPS.

On Saturday afternoon the foundation-stone of the Lunatic Asylum was laid at Kingsport, parish of Newmachar. The land, including the purchase price of the land (375 acres), the entire cost of the institution will be about £78,000. The architect is Mr. A. Marshall Mackenzie, A.R.S.A., who has adopted the style of the Late Scottish Renaissance.

Colonel J. T. Marsh, R.E., conducted an inquiry at Beckenham last week on behalf of the Local Government Board, into the application of the urban district council for sanction to the raising of a loan of £57,000 for works of private street improvement in Bromley-grove, Queen Anne-avenue, Warwick-road, and Church-road, Southlands.

A Board of Trade inquiry, conducted by Dr. Fletcher, was held at the County Offices, Preston, on Friday, into the application of the Lancashire Council for permission to erect a new bridge over the Hospital District of Preston, Fulwood, and the Joint Bridge for the construction of an isolation hospital at Fulwood under the Isolation Hospitals Act, 1893.

Formal sanction has been received by the urban district council of Exmouth from the Local Government Board for power to borrow £1,460 for works of sewerage.

At the meeting of the Tamworth Board of Guardians, on Saturday, a long discussion took place with reference to providing additional infirmaries recommended at the annual meeting. It was unanimously resolved to adopt the plans originally submitted, at an estimated cost of 25,000, the site to be decided in consultation with the officials of the Local Government Board.

The finance committee of Aberdeen Town Council have approved of the plans of a new theatre to be erected on Rosemount Viaduct. The front elevation will command the finest situation in the city, overlooking the sea-terrace gardens.

On Saturday night Mr. H. H. Thorneycroft's huge bronze statue of King Alfred the Great, which Lord Rosebery will unveil at Winchester to-day (Friday), was successfully raised to its granite pedestal. After the accident of the previous Tuesday fresh shreds were again stronger ropes were obtained, and every precaution was taken to prevent another mishap occurring. The statue stands in the Victoria, close to the Guildhall and the site of the bridge, founded by Eithrin, King Alfred's wife, and not far from it is Mr. Gilbert's bronze statue of Queen Victoria. The King is represented as standing with his left hand lightly resting on his shield, with uplifted sword in his right hand.

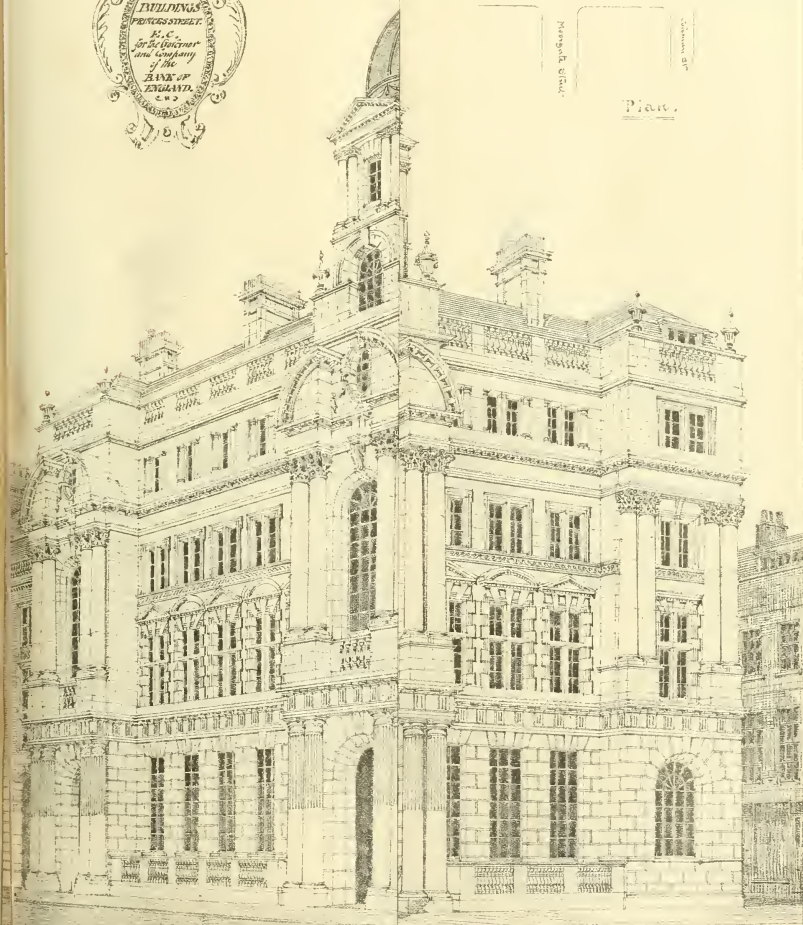
A site for another crematorium for London has been secured at Golder's-green, Hendon, adjacent to the terminus of the proposed Tube railway from Charing Cross to the City. Extensive excavations and building operations have already commenced.

The new organ at Lincoln Cathedral has now been completed by the addition of a contrapuntum stop, which gives an effect to the loud passages, resembling the ringing of cathedral bells. The building of the stop has been carried out by Messrs. Willis and Son, the builders of the organ.

There is now before the Falmouth Town Council a proposal to spend £12,500 on the extension of the piers and the construction of a promenade.

A new workhouse infirmary has been completed at Thornbury, at a cost of about £4,000. Messrs. Thomas Brothers were the contractors.

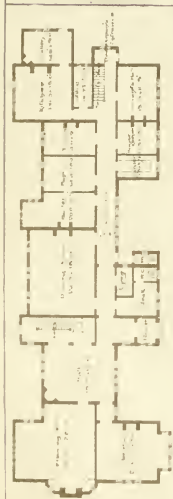
What is said to be the largest tree in Norfolk, known as 'Thwaite's Oak,' which stood in a meadow at Thwaite, St. Margaret, near the Suffolk border, has been felled and sold by auction. The trunk was 17ft. long, and had the huge girth of 21ft. and there were some branches nearly as big. When the trunk was stripped it yielded four bags of bark. The tree felled under the hammer £22 2s.



*Author: John Lubbock
Inventor: J. H. P.*





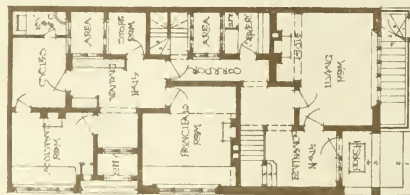


General Plan.

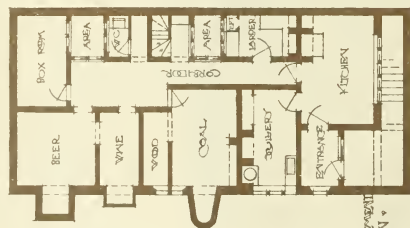




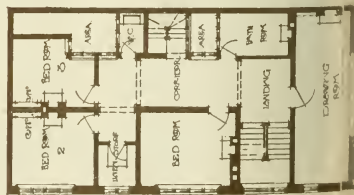
THE BUILDING DEWS, SEPT. 20, 1907.



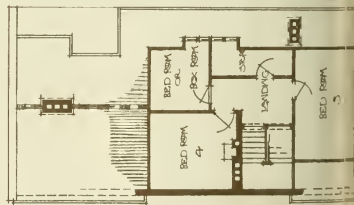
GROUND FLOOR



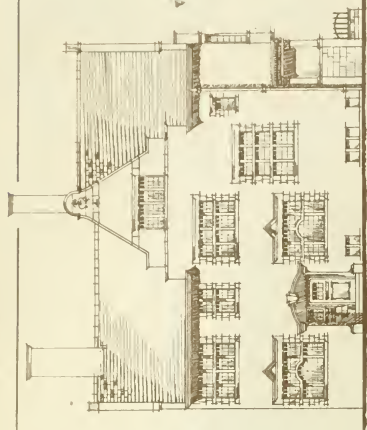
FIRST FLOOR



SECOND FLOOR



THIRD FLOOR

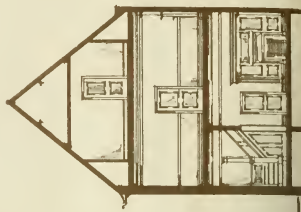
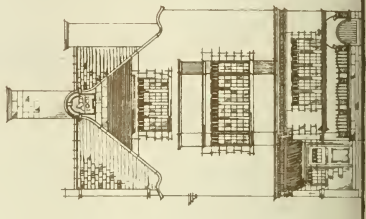


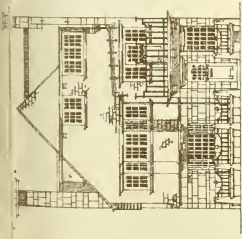
ELEVATION TO REAR ROAD

BNDIC

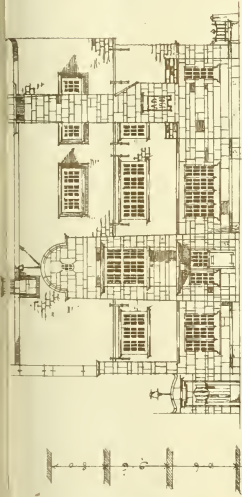
A. I.
ARCHITECTS
HOOD
WITH OFFICES
BY 105A
MONTAGNA

PLACED FIRST

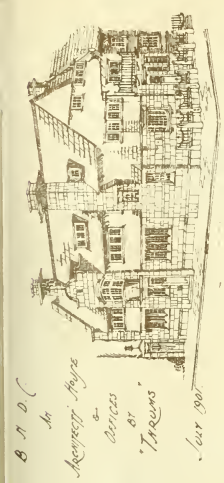




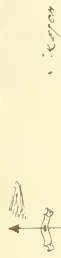
Front Elevation



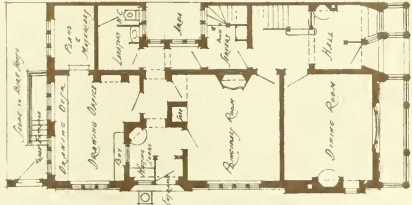
Side Elevation



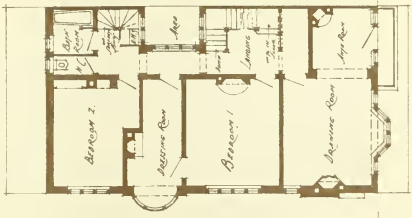
Rear Elevation
In
Acres
of
"Thruway"
Sur 190



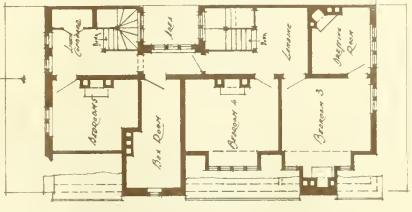
First Floor Plan



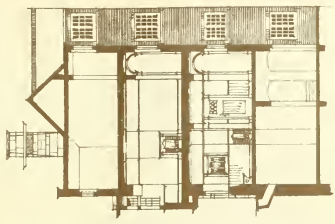
Second Floor Plan



Third Floor Plan



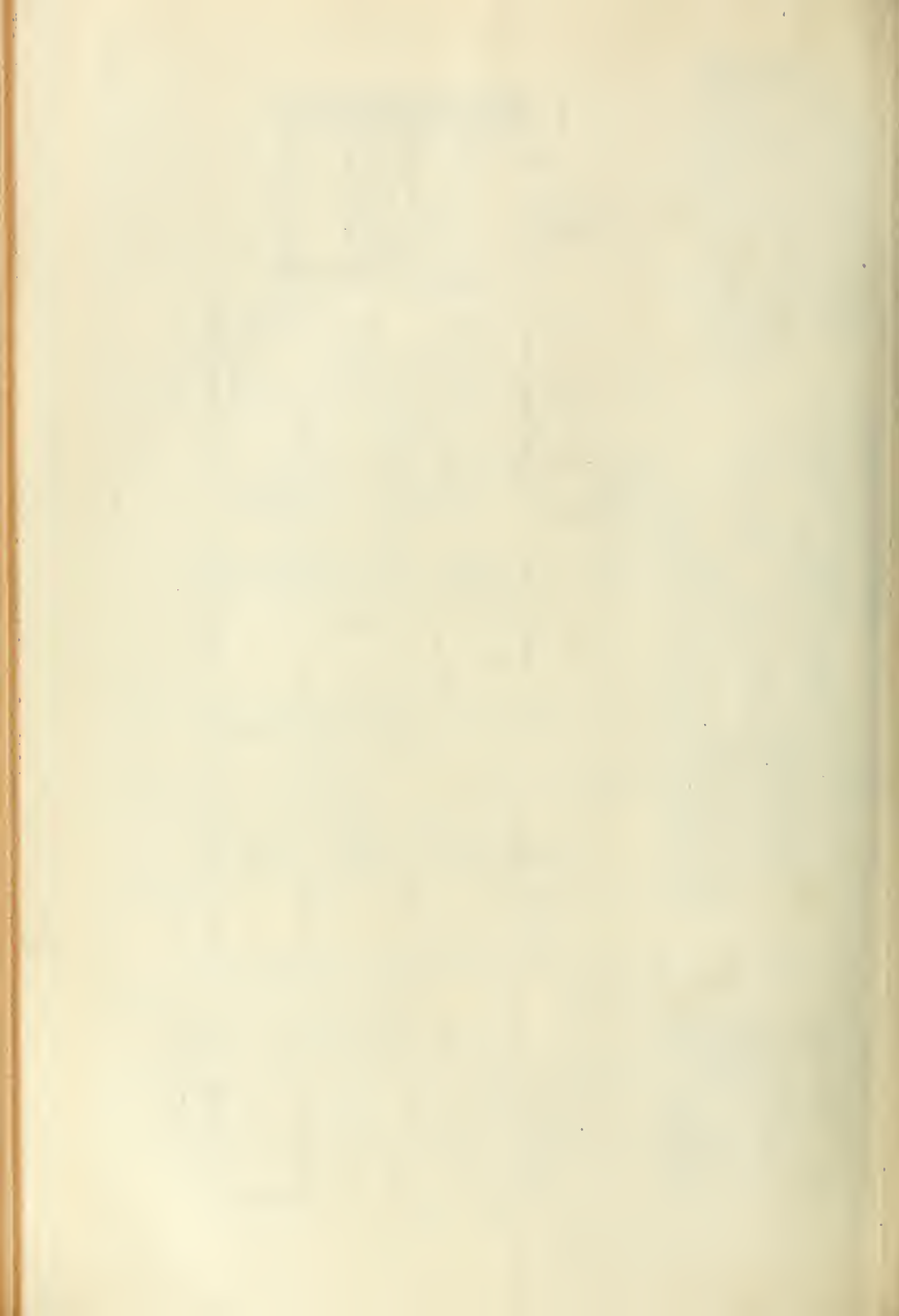
Fourth Floor Plan



Section A-A

Chimney

PLACED SECOND





THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXXXI.—No. 2438.

FRIDAY, SEPTEMBER 27, 1901.

PROFESSIONAL QUESTIONS.

VERY soon the architectural session will be opening, and the profession, returned from their holiday tours, will set themselves to the urgent business questions of the hour. Professional topics will, of course, occupy chief attention, and the two above all others are education and the protection of architects from incompetent pretenders. Other subjects bearing on practice, if we may make a forecast, will be the relation of recent legislation to building, and of these we may say a few words. Very important and far-reaching questions are those referring to the Model By-laws issued by the Local Government Board for new buildings in rural districts, of which we lately gave an outline; to the new drainage by-laws of the London County Council, which came into force in June last, changes which materially affect the profession as well as all builders, sanitary inspectors, and owners; also to the newly-framed rules issued by the same Council, under the Metropolis Management and Building Act Amendment Act, for the protection against fire of theatres and other buildings of public resort. These three topics, all of which we have noticed of late, are of much moment to the profession, as they deal with structures not only in the country, but in London and our towns generally. It will be a great relief for the architect practising in rural districts to know what powers a rural district council will possess; that they will be practically confined to regulations which affect health, such as damp-proof courses for walls and foundations, double or cavity walls, &c., to the air space about buildings, such is width of street, a certain area in the rear, height of building, windows, ventilation, drainage, sanitary fittings and conveniences, water-supply, &c. Any unnecessary by-laws affecting construction will not be enforced. These by-laws will exclude all buildings not dwelling-houses, or used wholly or partly for human habitation, and thus buildings for agricultural uses and outbuildings, like a summer-house, tool-house, &c., are excluded, though they are not to encroach on open spaces for new buildings. All structures dangerous to health are considered objectionable if in contact, and will not be exempt so connected—a condition which will ring through the law all farm-sheds, cow-houses, &c., if attached. These provisions will affect the architect in the preparation of plans for rural houses and farm-buildings, he areas to be provided in the rear of buildings are small, and may be increased with advantage in the country. The profession will no doubt have something to say about the by-laws relating to areas and drainage, and other points. One point that will affect professional practice is the deposit of plans and sections by those intending to construct buildings, and also their inspection by the Council. By some it will be objected that too much is required. Plans and sections are required of intended buildings to a depth of an inch scale, showing the position, form, and dimensions, and of every closet, earth-closet, asphalt, cesspool, or, and of any yard or ground; also a block plan to a scale of 1 in. to 4 ft., showing the position of buildings, appearances of properties adjoining; the uses of drainage; size, depth, and inclination of each drain; and the details of the ventilation proposed. Other sections are that any person doing anything

contrary to any by-law is to amend the same, is to afford the surveyor of Council free access to building during its erection, give notice of its completion, and be liable to penalties for non-compliance; and empower the Council to remove, alter, or pull down any work done in contravention of the by-laws. These are laws that will probably be considered rather stringent by country architects. Stringency of regulations is sometimes a hindrance to the profession, as owners of house-property are obliged to seek information or advice in the preparation of designs. On the other hand, it is also a deterrent to building, and often provokes aggressive action on the part of builders. On the whole, we do not think that those who build in rural districts should be hampered by unnecessary building regulations, or be placed under by-laws similar to those that are intended for urban localities. It would be monstrous, for example, to deny to the architect of a country house the exercise of his taste in selecting materials, by restrictions on half-timber work, tile-hung stories, sizes of windows, and the like, or to prevent him from erecting open porches and other attached structures that would be objectionable in a thickly-built town. By-laws relating to simple sanitary measures of construction are a different matter. These we have named are reasonable in the main, but would bear modification. Equally important as by-laws are those sanctioned by the Local Government Board in June last, for the new series framed by the L.C.C. under section 202 of the Metropolis Local Management Act, 1855, which will begin a new sanitary era for the Metropolis. The profession engaged in practice within the County of London will no longer be confronted by the difficulties attending upon divided administration, by providing in one district certain conditions of drainage that were not required by an adjoining local authority, and which left them very much under the thumb of the local surveyor or sanitary officer. The new by-laws will, it is hoped, supply a uniform code of drainage that will be acceptable to the sanitary authorities and to the profession. These new regulations have been made under two Acts: the Public Health (London) Act, 1891, sections 16 and 39, and also under the section previously named; and they relate not only to the drainage of buildings and their fittings, but also to underground drains. The repeal of the by-laws under the Public Health (London) Act relating to soil-pipes was necessary to the by-laws referring to drainage, as it was found impossible to provide for ventilation and underground drains without making the soil-pipes part of the system. It would be unnecessary here to refer to the by-laws as a whole under the two codes, as we lately gave a brief review of them. Reference to these codes will no doubt be made by the presidents of societies in their inaugural addresses, as they bear very intimately on future building. The application of these by-laws to existing buildings is likely to tax the supervision of sanitary officers. The object of this provision is that sanitary arrangements existing at the time these laws come into force shall be exempt from them only so long as they remain unaltered. When any pipe or drain has to be reconstructed or altered it has to comply with the by-laws. If an untrapped or unventilated drain of an old house be relaid, it must be trapped and ventilated in accordance with the new by-laws. If an old sink is broken and a new one substituted, it cannot be replaced by a new one unless the regulation as to trapped waste be followed. It can no longer be allowed to discharge into a run-water pipe, but over a surface trap as prescribed for a new sink. Also the re-erecting of "any building pulled down or below the ground floor, or of any frame building of which only the framework is left down to the ground floor, or the con-

version into a dwelling-house of any building not originally constructed for human habitation, or the conversion into more than one dwelling-house of a building originally constructed as one dwelling-house only, will be considered the erection of a new building." Architects and promoters of public buildings will also be directly concerned with the new regulations issued by the London County Council for the protection against fire and other public buildings of recent date. We have so lately noticed these that it would be unnecessary to say more now than to point to them as an important addition to the measures directly bearing upon the practice of architects. One of the principal rules is that of semi-insulation—a point that has been just accentuated by a Russian specialist in his address to the British Fire Prevention Committee, who pointed out the inferiority of our London theatres in this respect. These nearly invariably adjoin other buildings, whereas on the Continent theatres are generally isolated or protected by fire walls. He also pointed out the defects of the ordinary staircase which are without windows and proper exits, and compare very unfavourably with the Continental buildings. We have, indeed, much to learn from our Continental neighbours on theatre construction and appliances, as pointed out by Mr. Edwin O. Sachs in his comprehensive treatise on the subject. The question will no doubt be considered during the session. The rules published will form a subject of discussion. These are probably the nearest approach to a satisfactory code, though a few of the rules relating to entrances and exits, and height of tiers, and to exposed frontage, deserve reconsideration. The Architectural Association opens next month, and its day schools and evening classes will be resumed. The course of instruction is more than usually comprehensive. Some attractive papers are to be read at the ordinary meetings, which commence in November, amongst which we notice papers on "The Sanitation of a Country House," by Mr. Max Clarke; a paper on "Capitals," by Mr. F. Bond, M.A.; "The Development of Domestic Architecture from the 12th to the 18th Century," by Mr. J. A. Gatch; "Architectural and Constructional Engineering," by Mr. T. C. Cunningham; "Originality in Design," by Mr. C. H. Townsend; also papers on the "Preservation of Ancient Buildings," by Mr. W. D. Caroe; "Arbitration," by Mr. E. A. Gruning; "Artisans' Dwellings from the Municipal and Private Points of View," by Mr. O. Fleming; and Mr. L. Ambler—a fair series of subjects ranging from archaeology to prosaic building practice. In the selection of subjects for discussion, the greater the variety the better. A few of the above subjects are of a character better suited for a society of ordinary members; but for educational purposes, the question of the use and treatment of materials, and methods of construction would be of value to the younger members of the Institute. In such discussions, the practice of inviting outsiders engaged in manufacture and the trades to read papers or take part in the discussion is a good one, and deserves encouragement. The idea of bringing the artistic and professional, as well as the craftsman's, minds to bear on any point of construction, is likely to lead to more practical results than can be reached by the usual method of discussion. The question of architects' education and instruction, which we have left to the last, will, no doubt, be again brought up by the architectural societies both in London and the provinces. Every possible aspect of the question has been dealt with. We have had discourses of learned presidents, of architectural bodies, of free lances in the profession, and those who adopt the non-professional or craftsman's view. The professional, the traditional, and "advanced" schools has each had its say, and we are just in the same position. But there are signs of a reawakening to a

more rational view. The profession are beginning to discern the difference between scholastic and technical, and what may be called, for lack of a better term, the artistic requirements of education; and they begin also to see that a properly equipped architect cannot be turned out ready made by any process of examination conducted on the cramming system. Internal addresses have hitherto expected too much from these means, instead of advocating a course of instruction that will give the student a minimum but absolutely essential knowledge that can be gauged by an examiner for the practical wants of the profession. Unfortunately the profession are tied to certain modes of instruction, based on traditional systems, and have not yet had time to shake themselves free from the shackles which they entail. The method of encouraging students to discover things for themselves has to be tried again. Between draughtsmanship based on style, and examinations conducted on a variety of subjects, the future architect is expected to be found, but these ideals are strangely contradictory.

TECHNICAL EDUCATION AND THE BUILDING CRAFTS.

THE progress made in the technical trades connected with building has materially affected the profession. Up to the beginning of the last century the technical problems of architecture were not very numerous or difficult. A man with an elementary knowledge of masonry, or carpentry, as being the leading crafts, could get on fairly well with the design of buildings; they were just those arts of construction which kept the designer from exercising any of those unbidden feats of skill that were considered contrary to traditional rules of design. It was a period of substantial building, in which a few materials were employed, and during which the trades were not very different, men well skilled in the principles of their crafts. The system of apprenticeship for five or seven years was in force, youths were turned out who thoroughly understood the operations of masonry, bricklaying, carpentry, and joinery as then practised. Compared with the training and practice of to-day we may note many points of difference. First, architecture was restricted to a few classes of buildings; the field of its practice was limited. Second, the methods employed in building operations were few and simple; there were fewer channels for skill and energy than there are now. Third, technical education distinct from the workshop was unknown. Fourth, the trades were studied as a whole; subdivision of labour was scarcely heard of. Fifth, there were no machine tools or labour-saving appliances. Sixth, there was no competition. All these characteristics of the age rendered the trades more united and coherent; instead of restlessness and strikes produced by competition, men were contented and satisfied; they took a personal interest in their work, they became masters of their own crafts, for their time was not frittered away by numerous other studies they could only learn superficially. These conditions were quite changed with the development of machinery, competition, and technical education, which completely disturbed the old foundation, and produced a class of tradesmen that are either mechanical experts who can only do one thing well, or dabblers in all trades who have picked them up without learning them. They are the products of an age of technical schools, which has ignored the apprenticeship system, and placed a variety of subjects before the student instead of teaching him the fundamentals of his trade. These changes have produced their effect upon the architecture of our day. It would occupy a volume to point out the disintegrating action of each of these modifications on the personnel of

the worker and the quality of the architecture.

We may only indicate briefly how the increase in the number and complexity of modern building, and the multiplication of the methods employed, induced mainly by recent requirements and technical education, have influenced modern practice. The extension of the field of the architect's profession, in spite of its division into the engineering and surveying branches, is remarkable. In addition to the design of about half a dozen kinds of civil buildings, which at no remote date occupied his attention, the architect is now engaged on various structures set apart for the sick and invalid, for the infirm in mind, for the poor, for the education of the youth of all descriptions, for gymnastic exercises, for social functions and amusements, for hygienic purposes like swimming baths and washhouses, for commercial and industrial purposes like factories and warehouses, for numerous civic purposes, for refreshment, for the dwellings of all sorts of people—as in flats, and for a variety of other purposes that have sprung into existence during the last century. These several objects have necessitated a much wider scope of knowledge than any possessed by our predecessors. The scientific progress of the age is first and foremost in this extended field, and two very pronounced manifestations of science are those exhibited in the branches of construction and sanitation. The scientific spirit of the age has both checked and modified architecture. For a considerable time the artistic impulses were arrested. Science taught the architect to do many things differently to the way he had been trained—to use lighter and more economical means of support; to increase the access for light and air, to use iron upon scientific principles; it also taught him the importance of sanitation and the value of several improved materials and fittings. These things had the effect of arresting the development of the art, for it took some time before the profession could feel at home in the use of new materials such as iron, or apply principles of sanitation to buildings. We can just remember what the earlier results were, how clumsy and unsatisfactory the cast iron combined with the other materials, how it unsettled all principles of proportion. We saw heavy cast-iron beams supported by cast-iron columns of clumsy size and details currying walls of brickwork; but a close inspection showed that these supports were not proof against a fire, as they cracked, and imperilled the superstructure. Cast-iron, too, was subject to imperfect casting, to uneven contraction in cooling, which caused internal stresses. The requirements of large floors for factories, workshops, and other purposes opened the way for wrought iron and steel construction, and served to check these of brick and stone; the architect felt the shock of the innovation and had to unlearn a good deal of his former practice and to make himself acquainted with the new construction, which he knew very little about. The demand for a technical knowledge followed as a matter of course. The treatises of Hodgkinson, Barlow, Fairbairn, made it necessary for the architect to study these materials and their behaviour as he had done timber; then followed in succession experiments and researches in concrete, beton agglomere, new systems of fireproof floors, matters that were quite new. Can we wonder that the profession stood agliss at the new materials and studies that had to be mastered? A new class of instructors appeared who had no sympathy for art. Architectural studies began to fall flat, or to be given up to archaeologists, students of mere style, and it is only lately that the architect has begun to emerge from the chaos of scientific discovery. Lastly came the sanitary movement, which demanded attention to hygiene in its relation to building construction. All these things helped to create an architecture of a more scientific character,

in which modern improvements were incorporated. For some time it was a struggle as to which style could be made to embody these improved conditions.

Technical education and method have asserted themselves in a persistent manner during the last few years, and in directions which it may be of interest to point out. We refer chiefly to the extension and development of the crafts connected with building, and their influence on the profession. The influence of technical education on the various trades has been far-reaching. After the dissolution of the old guilds, the unity and co-operation that existed in the Middle Ages disappeared; each trade began to throw off the internal relations that had prevailed, each became a law unto itself, with the inevitable result of disorder and confusion. The trade of the carpenter and joiner began to assert its right to control the mason and bricklayer, and even to the late period the carpenter undertook the rôle of foreman on buildings; he also became a small builder on his own account. In like manner bricklayers have encroached on other trades—they have become slaters, paviors; the plumber often undertakes the duties of drain-layer, painter, and even decorator; the ironmonger tenders for plumbers' work and hot-water apparatus, and, on the whole, there has been a general overlapping of the trades, or an alliance between those which are more or less connected. Such a breaking up of the boundaries of the trades was unavoidable when once the tie that bound the crafts together was broken. The technical schools have also promoted the encroachment of one craft on another by instructing youths in a variety of subjects common to all the trades. The influence of these changes on architectural design is not without instruction. Building has suffered from the lack of co-operation between the different trades, and architects have gradually lost sight of making their details and intentions understood. The bricklayer does not study the mason's or the carpenter's requirements; each leaves the responsibility to the other or the following trade, and the architect's instructions are shifted to one another's shoulders. Technical science and instruction have been carried to an extreme, and with it there has been a corresponding loss of artistic feeling. The old craftsman learned by oral teaching or rule the principles of his trade. Say it was stone-cutting, he kept in view the artistic sense of proportion. The modern mason, on the contrary, is instructed by written rules by men who are merely students of solid geometry and mechanical expedients; the principles of design in stone are not inculcated at the same time, but have to be acquired afterwards. The process is learned apart from the architectural principles. It is so with brickwork, carpentry and joiners work, plastering, and cast and wrought-iron work. In fact the trade of the mason, the carpenter, and the joiner, with all their geometrical and mechanical principles, before the art is considered. The reason "why" stone should be so cut or shaped is not taught with the "How it is worked." The proportions of a brick capital or cornice are not learned by the youth who does gauge work in a technical class; it is the rubbing and cutting to the shape required that is taught, not the reason of the particular shape that has to be cut and rubbed. The tool used, the rubbing stone, bow-saw, gauge, parallel files, moulding-boxes, and other appliances all receive attention in addition to geometrical rules for setting out the template required in cutting arches, moulded work, niches, and other work. In carpentry and joinery the proportion of instruction given to mechanical, technical, and geometrical studies is far in excess of that given to the art instincts of the student, and the same can be said of ironwork. The conse-

quences of this is that workmen are turned out who are experts in mechanical execution, but are in no sense art-craftsmen.

Again, if we take a few typical building trades we shall notice how the technical spirit predominates. Building materials occupy a large portion of the advanced building education given to the young architect. He has not only to become proficient in the properties of limes and cements, stone, brick, timber, iron, &c., but to know their chemical nature and qualities, the manner they should be selected, their absorption, weight, and strength by theory and experiment. Even such a subject as limes and cements is a study requiring considerable time in its attainment, as in determining the hydraulic properties of these materials, their tensile strength and mode of use; a considerable knowledge of apparatus and experiments has become necessary for an architect, whereas half a century ago it was sufficient simply to know how to prepare and mix mortars. The student is supposed to understand certain tests of Portland cement, its proportion of lime, silica, and alumina, &c., how it is manufactured, the time it takes to set, its weight, and grinding, mixing, and so on, so as to be able to write a proper specification standard; so of the constituents of concrete, the proportion matrix to aggregate, how it should be mixed and laid, and also its use for floors, roofs, and stairs. Since our fathers' time asphalt, various patented plasters, and cements, and imitations have been introduced. Bricks, tiles, and terracotta have taken a large place in building, and have to be added to the architect's equipment. Every student who wishes to prepare for the "Advanced" and "Honours" courses of the R.I.B.A., the M.S.A., the City Guilds, Civil Service, and other examinations, must learn to specify stones for building, to distinguish sandstones from limestones, stratified from granular stones, to know their mineral and chemical composition, and to know which are best for weathering and working in different situations—a branch of study of considerable import. His knowledge of timber must be equally extensive in all that regards the selection, seasoning, desiccation, and preservation. The strength of timber, and the selection of proper brands for different uses are, of course, essential, and we believe the old-fashioned architect understood more of these requirements than many who have passed the modern examinations. The practitioner knew probably more about the chief varieties of pine used in building than the highly-crammed architect of to-day if we are to judge from the buildings of sixty to one hundred years ago. The use of constructional iron and steel has entailed a technical branch of knowledge unknown to the architect of a century or less ago. The student who wishes to pass an examination has to know something of the process of manufacture of iron, its elastic limits, its tension and breaking tests, besides the theory of its resistance and its application to construction—a study to which years may be devoted. The technical spirit pervades also the constructional operations of building. The old idea of making construction subserve architecture seems to have given place to the opposite construction and technical skill assert themselves. Instead of the modelled and sculptural ideal which actuated the ancient and Renaissance architects we have to endure the demands of engineers and experienced tradesmen. This struggle or compromise between the architect and the tradesman commences with the foundations. Modern foundations are infinitely more scientific than they once were. Methods of draining, sinking, timbering, piling, cylinder linking, steel and concrete grillage foundations have come into use, and the subject is now carried on by specialists. These methods involve calculation to determine the width of foundation for certain soils, and also to deter-

mine the resistance of rolled joists or beams placed at right angles to the wall to extend the base; as, for instance, having found the safe resistance of soil, the load in tons on wall per foot lineal must be divided by the safe resistance of soil to obtain the width of base. After this, a calculation has to be made for the iron beams, or their strength as cantilevers, so that they may possess the necessary resistance per square inch of section under a distributed load. Even wall construction is no longer a simple matter of laying blocks of stone of unlimited thickness, but is now a question of calculation and statute regulation. All sorts of materials have to be considered, and the stability of walls and other structures is now made a question of mathematics; and the formula of Rankine as to the limiting position of the "centre of pressure" is a question of calculation or graphics. Even this question is complicated by various conditions, as the strength of mortar, crushing, and sliding. Our forefathers regulated their wall thicknesses and buttresses by simpler methods—probably by a rule of proportion. Even those branches of constructive masonry—arches, vaults, and domes—which were of ancient origin, now make subjects for elaborate mathematical investigation, quite unknown to the old mason, who, however, never exhibited his ignorance of mechanical laws. His was an instinctive knowledge of the conditions of stability. Where our science is sometimes halting and cheepensaring in economy, the Mediaeval mason's insight was trustworthy. Whether he balanced moments of thrust by moments of vertical weight, as we do, his examples show a recognition of the law. Then the technical skill now required to pass one of the advanced courses of construction of brickwork—for instance, the arrangement of bond, flue construction, chimney construction, skew arches, &c.—is not easy. Fire-resisting construction is another extensive branch involving a knowledge of the strength of iron and steel, of concrete and joinery of a special kind, and the loads on floors; but it is too complex and technical to produce the architectural arrangement of timber and panelled ceilings we admire in 15th and 16th century buildings. This kind of construction is an expert business, and therefore it is largely out of the architect's hands. The number of patent floors calls for the attention of architects, and they are obliged to combine of steel and concrete or steel and fireclay has a future and a promise of art, but the subject is too essentially a technical one at present. Roofs and their coverings are not confined to a few materials like timber or masonry, but comprehend various types of iron and steel, combination of timber and iron, ribs of various kinds; and the covering materials are now very diverse, and include materials like galvanised iron, asphalt, felt, and a host of patented methods for glazed roofs. The craft of the joiner has been developed in various branches, and roof-working machinery has created a new class of workers. The skill and personal interest of the old worker has been thus rendered unnecessary. On the other hand, the technical school and the examinations and prizes given by the Carpenters' Company have to some extent counteracted the influence of machinery. The trade has been placed on a scientific basis, and the technical skill required to gain a prize is considerable. But design as a study for the craftsman has been neglected for the mechanical skill and workshop exercises. Plumbing is another branch of building that has been much neglected of late years, and is typical of most of the trades. The "certificated plumber" is a product of the just-past century. His art has been placed on a scientific footing, and the course of instruction a plumber has to undergo is precise and technical; but it is rather to the scientific side

his talents have been directed. Besides working in lead and zinc, he must be expert in sanitary science, in drainage, and sanitation. Other trades—the plasterer, glazier, painter, smith—all show a rawakening to the scientific and technical sides of their callings, but on the other side display a corresponding neglect.

The revised syllabus of the South Kensington examination on building construction, lately published, indicates the prevailing feeling of the profession, though it may not explicitly say so. It is really an answer to protests by students and practitioners have a word to say to examiners and teachers about the connection between school work and practice. A good deal of what is taught has little application to actual building. Formulae and diagrams as placed before the student too often bewilder him. They require a soul breathed into them to make them profitable and be the outcome of a design. But this is not to be obtained by promiscuous questions, which require a student to do impossible things, such as designing a labourer's cottage with complete quantities and cost estimate in less than half an hour. The numerical examples of formulae, if given, are not practical. As Sir John Gorst said the other day, speaking of examinations, they are not the best instruments for promoting mental progress. The delicately expanding intellect is crammed with ill-understood and ill-digested facts. Again, he pointed out that the class and school profess to give instruction in applied science to scholars who have no elementary knowledge of the particular science, and it has been proved that in these tests the smartest and shallowest succeed. The true education of the architect is to be taught how to build, to understand materials and their application, to be able to master the methods of construction when and where they are required. No cramming of technical details or scientific theories will make an architect, any more than technical science will make art. The two things move on parallel, not converging, lines.

"BUILDING NEWS" DESIGNING CLUB: AWARD OF PRIZES, SESSION 1900 AND 1901.

LAST week we completed our series of plates illustrative of the work of the Building News Designing Club for the past season, and to-day we announce the results of the competitions and award the prizes.

The first prize of £10 10s. is won by "Dan," Mr. W. J. Mountain, 33, Cambridge-road, Southampton.

The second prize of £3 3s. falls to "Thrus," Mr. A. T. Smith, Tan Yard House, Millbrook, Southampton.

And the third prize of £3 3s. to "1901," Mr. A. L. Holder, c/o. Mr. W. Westneve, 5, Bloomsbury-street, W.C.

The next three competitors whose work has brought them into the honours accorded Hon. Mention—viz., "Gow Chron," "Quercus," and "Iona."

The results thus obtained are determined simply by the number of occasions on which each competitor has been successful in the various contests. It has been somewhat difficult, however, to exactly adjust their relative merits, more particularly as between the third and fourth positions. "1901" was once first and once second, and so we have no choice but to give him the third prize, though the general work of "Gow Chron" on the whole was better. He was, however, never first, but twice second and twice fourth.

SESSION 1901-1902.

FIRST LIST OF SUBJECTS.

A.—A country side Farmhouse and Inclosed Garden with Summer-house in the corner. Site near the main road and some distance from the farm buildings. The accommodation to comprise a large living-room hall 28ft. long by 17ft. wide, and an angle-nook fireplace on one long side of the room. Entrance to be by way of lobby or vestibule, so as to divide external door from this

apartment, out of which the staircase is to lead with a good half-spare landing suitable for one or two pieces of old furniture, and leading into a mezzanine writing-room about 12ft. square. A parlour is to open out of the living-room hall and have a door out of the entrance vestibule for callers. Outside front entrance there is to be a good porch with a doorway out of it into a gun-room or smoking-room about 12ft. square. The kitchen is to be about 20ft. by 15ft., with scullery, washhouse, bakehouse, milk dairy, good larder, pantry, and store place. An inclosed yard in connection with offices to have a covered way on one side. Servants' w.c. in yard and a cycle-house to be provided outside. There are to be six bedrooms on the first floor, and two more, with fruit store and box-room, in the roof. The site slopes from N. to S. one in eight. House to face south on garden front and to be entered from the east or roadway side, where the gate is to be in garden wall, which will inclose an area 40ft. long from front of house, and as wide as the garden front, besides 12ft. extra on the east side, so that the entrance front will be 12ft. set back from road. The porch may form part of the wall. The style of the house to be suitable for a stone country, with stone slab slates. The first floor and upper walls to be rough-cast; chimney-stacks in brick. Windows to principal rooms on ground floor to have plain mullions and metal casements. Woodwork externally to be oak. A feature to be made of the setting out of the formal garden, which may be shown to a small block plan. Scale for the house plans 1 in. to the foot. Sufficient drawings to show the design, which must be simple and not over-detailed. View optional, on account of space.

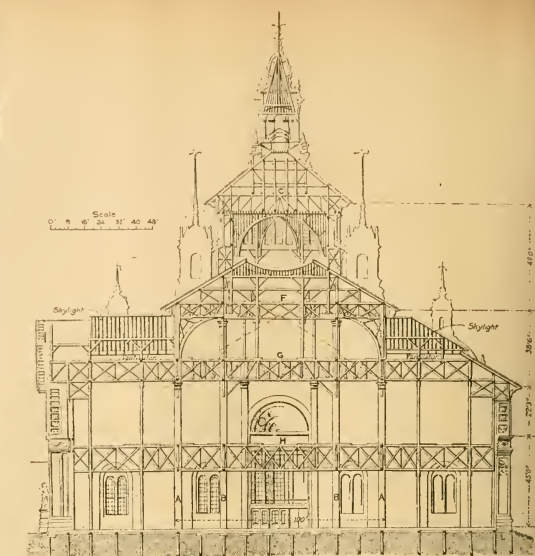
RULES:

The following are the rules to be observed by all who take part in the work of our club:—

1. Drawings to be sent within 28 days after the publication of the particulars of each subject.
2. One or more subjects will be given every month, from which a competitor may choose.
3. The drawings to be executed in firm black lines on white drawing-paper, in sheets of the absolute size of 24in. by 18in., unless an exception to this rule is named when the subject to which the deviation applies is set. No washes or tinting in colour whatever. Outline to be the first construction; but drawings may be lightly shaded with shadows executed wholly in line. Sectional parts to be shown in ruled "hatching," or blocked in. The scale to be used will be given with each subject.
4. Drawings to be forwarded, unmounted, by post, care being taken to pack the roll so that the drawings are not crushed through the post.
5. On entering the class (which may be done at any time) each competitor is required to furnish his name and address, which must be written legibly on the back of each drawing, as a guarantee of good faith, the *nom de plume* the author intends to adopt being boldly marked on the front of each separate drawing.
6. Prizes of £10 10s., £5 5s., and £3 3s. will be awarded to the best series of designs. Our decision to be final.
7. Before awarding the prizes any contributor will be expected to furnish proof, if it occurs, as to his age, and the time during which he has been engaged in professional pursuits, though no candidate need be strictly an architectural student. The same prize cannot in future be awarded more than once to the same student, and those who have taken a first prize cannot compete again.
8. We reserve the right of arranging the drawings for publication in any manner we deem necessary.
9. A critical notice of the designs sent in of each series will be given in an early issue following the receipt of the drawings.

THE HORTICULTURAL, FORESTRY, AND GRAPHIC ARTS BUILDINGS OF THE PAN-AMERICAN EXPOSITION.

THE Horticultural Building stands at the west end of the Esplanade, a large map in the *Engineering Record* of July 21, 1900, and is about 220ft. square and 67ft. high at the top of the first cornice, 105ft., to the top of the second cornice, 140ft. from the floor to the ceiling of the dome, and about 245ft. from grade to the top of the final above the lantern in the dome. From each side of the east end of the building, two curved wings about 26ft. wide and 30ft. high extend



SECTIONAL ELEVATION ON CENTRE LINE OF HORTICULTURAL BUILDING.

the Graphic Arts Building and the Forestry Building, twin structures 150ft. square and 18ft. high. There is a fountain in the middle of the semicircular court inclosed by the curved wings, and the wings themselves have an ornamental front, decorated with sculpture and mouldings, and are used for greenhouses.

Like most of the other Exposition structures, the Horticultural Building is built almost entirely of wood, and is elaborately decorated on the exterior with mouldings, relief work, and sculpture. Around the outer part of the building there are pitched roofs supported on wall columns and trusses, and extending about 60ft. inward from each of the four outer walls. The central part of the building, 100ft. square, rises above the tops of these roofs, and is covered by a pitched roof surmounted by a central tower, dome, and domed lantern. Small pinnacles, spires, and domes are arranged on the main roof, as indicated by light lines in the sectional elevation, which is taken on the axis of the semicircle about which the three buildings are symmetrical.

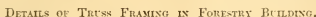
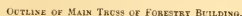
The foundations of the columns and the supports of the floor-beams are on piles capped at grade and filled around to above the original surface of the ground. The wall columns, about 70ft. high and from 20ft. to 25ft. apart, are single 12in. by 12in. timbers, lap-spliced in the middle and braced together by gallery trusses, H, 12ft. deep, with their bottom chords about 28ft. above the floor. Similar Howe trusses connect the tops of the columns and the twelve main columns, A, on the sides and corners of a 100ft. square in the centre of the building. In the centre of this square there is another parallel square with 30ft. sides, having main columns, B, on its corners only. These columns are connected together by more 12ft. Howe trusses, G, in the planes of the sides of the squares and at the height of the wall column trusses.

The outer columns extend above the trusses to a height of 105ft. above the grade, where they intersect the roof surface. The inner columns terminate at about the same height and are connected with the outer ones by Howe trusses, F, 8ft. deep, with their top chords level with the tops of the columns. Posts and braces on top of these trusses support the pitched roof, about 31ft. wide on each side of the large square,

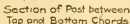
which overhangs the clerestory wall about 6ft., and terminates at the upper part in the walls of a cylindrical tower, 44ft. in diameter, which are covered by the interior dome.

At the height of the top of the wall trusses, about 80ft. above the floor, the inner sides of the intermediate columns are connected by a cornice moulding which forms a 100ft. square from which the coved ceiling springs to a height of 10ft. above the floor. Here it intersects a hollow square measuring 52ft. on a side, which is formed of a horizontal moulding attached to the inner columns, and projects horizontally beyond it towards the centre of the building to the intersection with the moulding or cornice around the lower edge of the inner wall of the cylindrical tower. Each of the four sides of the coved ceiling is a quadrant of a cylindrical surface of 17ft. radius, and is plastered on Byrrkit sheathing attached to double 2in. by 12in. scarf boards braced to the columns and overhead trusses.

The cylindrical tower walls rise to a height of 150ft. above the floor and are covered by horizontal ceiling supported from the lower chords of the Howe trusses marked C. At the foot of this wall there is a circular inner balcony 4ft. wide, and in the wall are eight arched panels 20ft. high. Just above the top of these panels there is a heavy cornice moulding from which, between the panels, eight solid dome ribs spring to the centre of the flat ceiling above. Between each pair of ribs are three glazed windows looking out on the colonnade which surrounds the tower and rest on the pitched roof. In this colonnade there are eight pilasters, and between each pair of pilasters there are two pairs of columns with their top connected by arches which apparently support the circular tower cornice 155ft. above the floor. This cornice is about at the centre line of the trusses, C, supporting the tower roof, which is the frustum of a cone 70ft. in diameter at the bottom, and overhanging the tower about 6ft. The diameter at the top is 21ft., and on it is a circular lantern about 20ft. high, having eight exterior ribs or pilasters and sixteen columns with a window in every panel between columns. Above the windows there is a flat ceiling below the roof-trusses which support the hemispherical dome, which has a radius of 15ft. 10in. The dome is framed with double scarf boards about

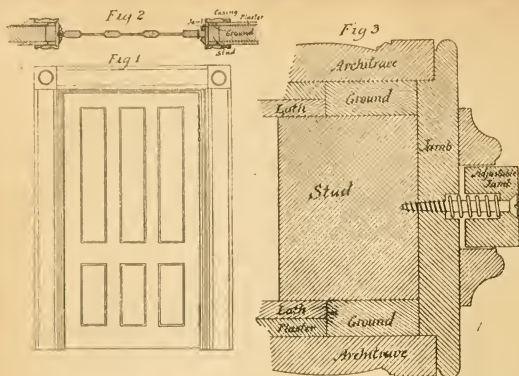


each made of four 12in. by 12in. timbers set 12in. apart in the clear on the corners of a square, and latticed from top to bottom on each side with 2in. planks. They are covered with Byrkitt sheath-



ing and plaster, and have chapters at their intersection with the coved ceiling. The eight columns in the walls of the circular tower are 14in. by 14in. timbers inclosed in wide casings

Mr. R. S. Peabody, Boston, Mass., was the architect of this group of buildings, and the construction was detailed and supervised by the staff of the Exposition, Hon. Wm. I. Buchanan, director-general; Mr. Newcomb Carlton, director of Works; General S. J. Field, chief engineer; Mr. Williams Lansing, supervising architect.



are preferable to wide joints, and do not set up expansion as supposed by some. The closer the joint, the more even will be the surface, and the easier it will be to maintain clean and sanitary surfaces. Close-jointing with a composition of pitch and creosote oil is recommended. Objection has been made to wood-paving that it harbours disease germs and absorbs moisture, but bacteriological examinations have not established a case against hard wood. Soft wood may be open to the objection to some extent, especially if not creosoted and laid with wide joints, as it is naturally absorbent of moisture; but Jarrah and Karri blocks are practically non-absorbent. The Jarrah blocks in the Strand, which are 2in. deep, were found to have worn on the line of traffic only 2in. in three years; whereas 6in. deal blocks previously put down had been ground in twelve months. Other parts of London have had similar experience. The Paddington Vestry some time ago reported that the life of hard wood exceeded the reputed number of years shown in a table, and strongly recommended the vestry to follow the example of other parishes and discontinue the use of soft wood. Jarrah wood was recommended. In fact, this wood has since been very extensively used in London and the suburbs, having in many instances been substituted for yellow deal paving and asphalt. The hard wood pavements laid down in Sydney, where the traffic is heavy, were described in a paper read at the Institution of Civil Engineers some few years ago. The foundation was stated to be concrete 9in. thick, composed of 5 parts of 2in. basalt, 2 parts of clean sharp sand, and 1 part of cement. The top was floated over with 1in. rendering, composed of 3 parts of sand to 1 of cement. The blocks, tallow-wood and red mahogany were dipped twice in boiling tar, and stacked two days to allow surplus tar to drain off. The surface was tarred and sanded, and a thin coating of basalt screenings were spread over it to form a foothold. A similar method has been adopted in many of the recently-laid streets in the Metropolis, and the results have justified the means employed. Recently the widened roadway in the Strand, opposite the proposed new avenue to Holborn, and extending eastwards to the Law Courts, has been relaid with hardwood blocks treated in a similar manner, and an excellent surface has been made for the large traffic. We hope other borough councils will follow the example of relaying their present unsatisfactory roadway with hardwood blocks close-jointed, and so attain an approach to uniformity of surface that has been so long wanting during the administration of the old vestries. Many wood pavements known by various names have been tried, but the conditions of success in most of them depend on similar principles being followed.

AN ADJUSTABLE DOOR JAMB.

THE adjustable door jamb designed by W. L. Savage, of Bridgeport, Conn., illustrated herewith, is a device for use in the construction of door jambs. The adjustable feature, as shown

in Fig. 3, is simply an adjustable jamb 1½ in. by 1½ in. in size, placed in front of the usual jamb 1½ in. of the illustration. The jamb to which the door is hinged is stationary, while the other is laterally adjustable, as shown in the larger section, Fig. 3. It is held in position by screws 2½ in. in length, located at regular intervals throughout the height of the door jamb. The stationary and adjustable jambs have a recess surrounding the screw in which are spiral springs. These continually press outward the adjustable jamb, the position of the latter being wholly controlled by the screws. Mouldings are placed at each side of jamb, so as to cover up all space that may be observed between the jambs where separated.

The object of this device is to compensate for the swelling of doors in damp weather and prevent the usual sticking at the jamb by simply regulating the position of the latter, which is done by turning the screws in and out. Mr. Savage states that this simple device has been in use in many buildings with much satisfaction.

THE DEVELOPMENT OF BITUMINOUS PAVEMENTS.*

ALL forms of bituminous pavements, whether manufactured from natural or artificial asphalt, are, in fact, artificial stone pavements. The industry started with the use of the natural rock asphalt from the mines in the Val de Travers, Canton Neuchâtel, Switzerland. The mines were discovered in 1721, but it was in 1819 that its utility as a road covering was first noticed. The rock was then being mined for the purpose of extracting the bitumen contained in it for its use in medicine and the arts. It is a limestone found impregnated with bitumen, of which it yields an analysis from 8 to 14 per cent. It was observed that pieces of rock which fell from a wagon were crushed by the wheels, and under the combined influence of the traffic and heat of the sun a good road surface was produced. A macadam road of asphalt rock was then made, which gave very good results, and finally, in 1834, a portion of the Rue Bergeyre in Paris was laid with compressed asphalt on a concrete foundation. In 1853 a still larger sample was laid, and from that time it has been laid year by year in Paris. From Paris it extended to London, being first laid on Thackeray Street in 1859, and Chesham in 1870, and in successive years on other streets. It has also been extensively used in Berlin and other cities on the Continent. The early success of the asphalt pavement in European cities led American contractors to seek the manufacture of an artificial asphalt to which would have similar qualities, and the first idea was to utilise the tar produced at the gasworks, which was then almost without value. The result was about twelve to fifteen compounds, varying only in detail, being all essentially composed of tar, or coal-tar pitch and sand, forming an artificial sandstone. Large

quantities of these pavements were laid in Washington and other cities between 1870 and 1874, the stone pavements on Fifth Avenue, New York City, being surfaced in this manner. A large number of cities, especially in New England, use this artificial mixture successfully on sidewalks, and the coal-tar sidewalk continues to be in greater use in Massachusetts than all other forms combined. The result on street work was a general failure, and the impression has since generally prevailed that coal-tar or its products are entirely unsuitable for roadway construction. The work was done at ridiculously low prices by contractors who had no previous familiarity with the construction of bituminous pavements or incentive to improve; and, in fact, at the time the pavements were laid, no one in America or Europe had any accurate knowledge of the requirements necessary to produce good work. A few of these pavements, however, are in use to-day even on roadways, and have been in use longer than any asphalt pavements in existence in this country or in Europe. It is thought all failures can be traced to the use of inferior grades of coal-tar, improper methods of preparing the cement, and the use of improper sand in the wrong proportions. The early failure of the artificial asphalt pavements put them almost entirely out of use in roadway construction. (German chemist, Professor de Smelt, had secured a patent on a formula for making a bituminous surface, using natural asphalt as a cementing material. Experiments were made with Mexican, Cuban, and Trinidad asphalt. The so-called Albertite, Gilsonite, and other bituminous found in this country were also tried, but generally without success. Small samples of the Trinidad Lake asphalt pavements were laid in Newark, N.J., and in New York City in 1870 and 1871 respectively; but it was not until 1873 that a pavement was laid on a large scale. Chemists generally knew that there were physical properties in asphalt which made it impossible for them, by any chemical test, to determine the durability or utility of any given asphalt, and no city could be induced to adopt this form of pavement until, from actual test, it had stood in Fifth Avenue in New York City for several years. Traffic of 400,000 vehicles, for several years. In 1876 Pennsylvania Avenue, in Washington, was in an almost impassable condition, being covered with a rotten wooden pavement. Congress directed its repaving, and appointed a commission consisting of Messrs. A. C. Gillmore, of the Corps of Engineers, and Edward Clark, architect, to have supervision of the work. The terms of the law directed them to lay the best known pavements. They advertised for proposals, making no restriction as to materials. They received forty-one proposals, covering every variety of stone, wood, macadam, and bituminous pavements. Out of them all the commission selected two, and laid these respectively on two-fifths and three-fifths of the avenue. These were the natural rock asphalt from Neuchâtel, and the Trinidad Lake asphalt mixture. Both pavements were completed in the spring of 1877. The Neuchâtel pavement lasted about ten years, while the Trinidad Lake mixture was not resurfaced until 1890. After 1876, under the present permanent form of government, the asphalt pavement became the recognized pavement in Washington. It has spread from Washington to many other American cities, Buffalo taking the lead, with something over 300 linear miles, Philadelphia and New York City also laying large quantities each year. Many other forms of asphalt have from time to time come on the market, and have been laid with more or less success. The physical differences which existed in the new varieties of asphalt have made it necessary for their promoters to develop new formulae, and to endure many poor pavements laid during early stages in the development of the pavement. It seems to be a fact that the early asphalt pavements caused as much annoyance to the promoters as did the early coal-tar pavements, but they were generally laid at a good margin of profit, under a guarantee system which justified and encouraged the most careful methods of manufacture and repair of defects. It is interesting to note that some of the most careful methods of construction and repair of the manufacture of the bituminous surface, it is to the credit of the established paving companies that they have succeeded in laying asphalt pavements so satisfactorily. As late as 1885 some of the pavements laid by the most experienced companies were complete failures when first laid, and the cost of repairs during the first five years

* Extracts from a paper read before the League of American Municipalities by FRED J. WARRICK, Boston.

sometimes amounted to twice the original cost of the construction of the wearing surface, while the average cost of the most experienced companies for the maintenance of pavements laid since 1870 will have averaged a per cent. of first cost of surface during the first five years, and the pavements are frequently in perfect condition without repair at the end of that period. When it is considered that a slight variation from the proper proportions of ingredients brings about disastrous consequences, the improvements and the results are not surprising. The greatest failures were due to improper selection of the sand or mineral grain. Sands which careful analysis show to be very different are frequently so closely alike in appearance that the most expert eye could not detect the difference. There was no record kept of the nature of the sand until recent years, almost any sand being considered suitable. The bitumen is used to surround the grains of mineral matter for the purpose of cementing them together. In the Richardson patent formula, used in the Trinidad Lake pavement, the mineral grain is so fine that the aggregate surfaces of the grains is as slippery as the surface of a 1,000-in. diameter ball. The thickness of the wearing-surface, and the coating of bitumen around each grain is about one four-thousandth of an inch in thickness. If the sand is not of such graded sizes that the voids are approximately filled by the bitumen used, then on exposure in such minute particles the surface will be certain to show a certain amount of evaporation and decomposition. A slight variation in the size of the grains makes a great difference in the area of grains to be coated with bitumen, and, in turn, in the thickness of the coating when a given proportion of bitumen is used, and consequently upon the life of the pavement, which it would take to change its physical condition on exposure. So great is the difference that a given bulk of sand, of an even size, passing a No. 200 screen, contains about 30 times as much surface to be coated as does the same bulk standing between a No. 10 and No. 20 screen; and about 1,000 times as much surface to be coated as does the same size of grain passing a 2-in. screen and standing on a lin. screen. In the effort to duplicate the Neufchatel pavement, the entire development and practice has been to exclude from the bituminous mixture all mineral grains coarser than about $\frac{1}{16}$ in. in diameter. A form of bitumen has been used in the Trinidad Lake pavement has been used in England with very variable results for more than thirty years, and also in a few American cities. The process employed is defective in principle, and does not accomplish uniformity. I feel that there is little permanent merit in the use of crude tar, or in coating stones of even size laid in courses, with an effort to roll the several courses together, as the very life of the bitumen depends upon its proper selection, preparation, and use, in proper proportions, with a dense mineral mixture. Considerable investigation has convinced me that both practices are wrong, and that the future development of bituminous pavements will be along the line of using a coarser mineral aggregate than is used in the asphaltic pavement, and more modern methods than employed in tar macadam. The advantages of a coarse grain are: First, the coarse grain gives rigidity in itself not given by fine grains, and also gives a surface which will not wear slippery. Second, it is, therefore, possible to use a softer cement, which will have longer life. Third, a heavier coating will be secured around each grain, which will tend to increase the life of the bitumen if exposed. Fourth, the voids can be greatly reduced, thereby avoiding the exposure of bitumen in the surface particles. Fifth, lower temperatures can be used in mixing, and consequent saving in fuel and labour. Sixth, less danger of injuring the bitumen by overheating in the process of making cement or mastic. The mixture to be used in any particular place, and the always be determined by experts who will recognise the conditions present, and the special treatment necessary, as the complications are many. Under proper instruction failures should be reduced to a minimum. A pavement constructed on above principles would be a bituminous-concrete pavement, as distinguished from the bituminous-sand surface of the asphaltic pavement. Owing to the nature of the mixture, I think the best forms of coal-tar, properly treated, will furnish the best form of bituminous cement for such a pavement. The bituminous stone used should be the hardest procurable, and I do not see on reason why, under proper development, the bituminous cement will not find the

mineral matter together until the stone itself wears out, under moderate traffic. I should not advise placing such a pavement on the heaviest-travelled streets of large cities at the start. It would be best to develop perfection under more moderate usage. I think the term bituminous macadam is a suitable name for such a pavement, as it contains all of the good points of a first-class macadam road with durability and cleanliness added; and, owing to the coarse grain, it is not as slippery as other forms of bituminous pavements. An equipment of 3,000dol. to 4,000dol. in machinery would be sufficient to lay 300 to 1,000 square yards per day of bituminous macadam, and municipalities, under proper supervision, could do the work themselves much cheaper than by contract.

CHIPS.

An electricity generating station is about to be built on the east side of Grove-road, St. John's Wood, between the Regent's Canal and Lodge-pole-road, Central Electric Supply Lights, Ltd., Limited. Mr. C. Stanley Peach is the architect.

The construction of the new Manchester Race-course, to replace the one at New Barns, which will be absorbed by Ship Canal extensions, is proceeding satisfactorily, and racing may take place upon it in the autumn. The new stables about 12 acres. Forty turnstiles will admit the public to the ground, which is well equipped with stands, and amongst the arrangements made for dealing with large crowds is the erection of an ambulance house. Accommodation is being made in the stables for 244 horses, and a novel feature of the paddock is a covered ride where the horses may parade in wet weather.

The Financial Secretary to the Treasury has issued a return showing that the London parks and botanical gardens, which are maintained out of the national income, cost £483,973. In the ten years ending 1891, £492,973 was expended in the maintenance of these "lungs," in addition to £66,683 laid out on improvements.

A memorial stained-glass window has been placed this week in the parish church of Craigrowan. The window is composed of three small stained lights, and is next the main transept entrance and the baptismal font, the subject being that of the Nativity. Miss Nellie Muir-Wood, of Glasgow, has both designed and painted the window. In the centre is a high and upright figure of the Virgin, dressed in blue, and holding on her left arm the Child. To the left of the Virgin there are two figures in the side light, one that of a kneeling king holding forth the infant Jesus, and the other a kneeling woman, the swartly Bethsarah of legend. In the corresponding light on the right are a shepherd prince and in the foreground a kneeling youth.

Messrs. Smithdale and Son, of Ayle, engineers, are now engaged in putting in two complete new Cornish boilers, with all new fittings, for the Littlemillon Drainage Commissioners, at Ramsey, Hunts. The boilers are built for a working pressure of 90lb. to the square inch.

The trustees of the Littlestone-on-Sea Convalescent Home have accepted a tender for the building of the Permanent Convalescent Home for Women and Girls, which is to supersede the two small villas now in use. The main building, with accommodation for forty beds, is to cost about £4,700, and the maternity wing a further £400, or £5,100 in all.

There is about to be despatched to Lokoji, Nigeria, from the establishment of Messrs. Macdonald and Co., Limited, Aberdeen, a memorial-stone for erection on the grave of the Hon. David Carnegie, which was killed in the Boer war, in the month of June last year. It is of Rubislaw granite, and, standing on two bases, is about 6ft. 3in. high. The polished face of the stone has a Greek border.

At their last meeting the urban district council of Penmaenmawr opened nine tenders for the work of cleansing the town, and among the proposals to support the new promenade, no tender was accepted, the council resolving to do the work themselves under the supervision of Mr. Worrall, their surveyor.

The London United Electric Tramways (Limited) have given notice to local authorities in Surrey of their intention to apply for further extensions of their system of electric tramways in the county as follows:—(1) A line from Epsom to Wimbledon, along the main Epsom road through Ewell, Epsom, and Epsom Downs, and (2) a line from Sutton to Epsom through Ewell, Cuddington, Cheam, Sutton, and Carshalton; (3) a line from Epsom to Ewell; (4) a line from Hook to Leatherhead, through Chessington; and (5) the company's proposals to lay a line to Epsom Racecourse. The company promise that the fares shall be less than a halfpenny per mile, and less than a quarter of that sum for the industrial classes between certain hours.

OBITUARY.

Mr. T. T. Marks died at his residence, Plas Myrdind, Llandudno, on Thursday night in last week, at the age of fifty-seven years. Mr. Marks was born at Curmhorath. After serving for a short period in the engineering works of the Great Western Railway Company, he was appointed to a post under the Swansea Corporation, from which he was promoted to the position of borough surveyor and engineer at Lowestoft. In 1876 he was appointed clerk and engineer to the Llandudno Board of Commissioners, and it was under his direction that the new scheme of water supply from Lake Dulydn was carried out. During his term of office a number of other public improvements were effected, including the erection of the gasworks and the construction of the Promenade. Having held office for fifteen years, Mr. Marks resigned his appointment, to undertake private practice, and three years later was elected, at the head of the poll, to a seat on the council which he had so well served in an official capacity. His abilities and services were recognised later by his election to the chairmanship of the urban district council. Mr. Marks was an Associate of the Institution of Civil Engineers, and in 1872 was one of the original founders of the Institute of Municipal Engineers and Surveyors. He leaves a widow and two sons.

Mr. OGDEN EVA, borough surveyor and sanitary inspector of Helston, passed away on Friday at his residence, Penrose-road, Helston, aged sixty-one, after a short illness. Deceased came of a very old and respected Helston family, all the members of which have been builders, carrying out many important contracts in the neighbourhood. Deceased was a member of the Helston Town Council for many years, but resigned some twelve years since, when he was elected surveyor. He was an old Volunteer, and also a Freemason.

The St. George's Upper School, Borough-road, which is now being rebuilt, was founded in 1698. It is one of four of the oldest schools of the kind in the Metropolis.

Colonel W. Laughton Coke held an inquiry at the Town-hall, Manchester, last week, respecting the application of the corporation for sanction to borrow £40,000, to be used in the erection of public baths in High-street, Manchester, and in a room known as the Victoria Baths. Mr. T. de Courcy Meade, C.E., produced the plans and elevations of the buildings, which he said were three stories in height, and would comprise 150 plunge baths, the largest of which would be 75ft. by 40ft., the others having a width of 35ft. and 30ft. respectively. There were also to be club and storage rooms, and Russian and Turkish suites of baths, and 64 shower baths.

The Leeds City Council have appointed Mr. James Bell, of Glasgow, as clerk of works of the Market Hall, about to be built from plans by Messrs. Leeming and Leeming, and recently illustrated by us.

The light railway scheme for the heavy woaden district of York-shire, including Dewsbury and Bradford, already conditionally sanctioned by the Board of Trade, was discussed at a conference of local authorities at Dewsbury Town-hall last week. The scheme, which is to cost £240,000, is to be carried out at once, 24 miles of tramways being laid. The chief engineer of the British Traction Company, promoting the scheme, said that they favoured the central trolley, or overhead wire system, though the expense was greater than the other method. They intended to start to have an equipment of 44 cars, with sufficient double and single lines to provide a five minutes' service throughout the district with 64 cars. The scheme was generally approved.

Lord Braybrooke has given to the Saffron Walden Parish Church eight very ancient brass effigies. It is supposed that they were removed from the church about the year 1643, when the work of spoliation was begun, for in the churchyard's records it is said that you occur this entry:—"Received from John Parnment for the brasses taken off the gravestones by an Ordinance of Parliament, which weighed 7 score 15 pounds, 42 lbs." It is not known when the brasses were first brought to Audley End. The vicar and churchwardens have had them fixed upon the wall in the north aisle of the church.

An application will be made in November next for permission to extend the new Skipton and Grassington Light Railway, and to further extend the same to present terminus at Grassington as far as Kettlewell. The proposed extension was only abandoned last year because there was not sufficient time to complete the preliminaries. Mr. E. O. Ferguson is the engineer.

Building Intelligence.

ASSET. Out of a large number of tenders submitted for the alterations on the acreage at Asset, that of Messrs. Allen and Sons, Kilburn, has been accepted by Lord Churchill and the committee, and the work has been already commenced. The Royal stand, the Jockey Club stand, the Master of the Buckhounds stand, the Press and trainers' stands, together with the range of buildings used by the handicappers, those used as magistrates' rooms and printing offices, and those set apart for the accommodation of the Royal horses and carriages, which were sold by auction last month, have all been levelled to the ground, in fact, everything on the ground, with the exception of the Metropolitan police-office and the post-office has been removed. In the space thus provided will appear a range of buildings to be erected to the design of Mr. C. W. Stevens, the architect, which has been approved by the King. The buildings, which will be chiefly constructed of iron and wood, will not be in line with the grand stand as hitherto, but will be brought forward at an angle to enable the occupants to get a better view of the races as the horses come up to the judge's post. This will necessitate the cases being altered, and instead of ranging in a straight direction to the Grand Hotel, it will now take a gentle curve. The upward gradient to the winning-post will also be reduced. In order to get the work completed by June, 300 or 600 men will be employed. They will work in day and night shifts, for which electric light will be installed. The workmen will be conveyed by special train to and from Reading daily.

KENSINGTON.—During the summer vacation extensive works have been executed to Essex Church, The Mall, Kensington, and to the large assembly-hall and schoolroom underneath the same. The wood roof of the church has been cleaned and varnished, and the whole of the internal brick and stonework brushed down and cleaned. The whole of the old gas-fittings have been removed, and the church has been lighted by electricity. The schoolroom and school-rooms underneath the church the electric light has also been installed, and a new heating apparatus fitted. The cost of the various renovations has amounted to upwards of £150. The renovation has been carried out under the personal direction of Mr. Howard Hatfield Clarke, of Bishopsgate-street Within, the architect, and the building works being executed by Messrs. Campbell Smith and Co., Ltd., of Newman-street.

REGENT'S PARK.—The renovation of St. Stephen's Church, Avenue-road, Regent's Park, is drawing to a close. The chancel is rich in colour and gold. On the upper part of the east wall are painted angels with censers in allusion to the Armistice. On each side of the east window under canopies on mosaic grounds are figures of St. Stephen the Martyr and St. Andrew leaning on a cross saltire. The reredos, yet to be finished, will be relieved with gold ornament on gold grounds, and the figures of the four Evangelists in gold on red mosaic grounds. The side walls are diapered in 15th Century style, supported by arcades, the emblems of the Passion in gold, and a rich dado in reds, green, villum, and gold. The nave walls were diapered with borders to wall-date and window headings. The pendants are filled with ornament in salmon, green, and ochre, with various devices in white on red shields. The work has been designed and carried out by Messrs. H. G. Bartlett and Co., Brixton.

SOUTH LAMBETH. The opening ceremony of the United Methodist Free Church and schools, Fencham-road, South Lambeth, S.W., was performed at the fourteenth anniversary of the building. The church is designed in Perpendicular Gothic, freely treated, with a general pitch-squares of outline. The facings are of red bricks, and the dressings of Bath stone. The roofs are covered with green slates. The church, school, and chapel prior gates all face a Pentamere-road. The school, which is a new building, is given to the church. The church consists of nave, transept, and apse, with side organ chamber opening by arches into both apse and choir. Accommodation for the choir is provided in the apse. The organ loft of the church is used for purposes. A large schoolroom which is situated to be divided off into number of classrooms, with gallery around with wrought-iron

grille front is provided. Also church parlour, vestry, ladies' waiting room, library, infants' room, kitchen, with commodious lavatories, &c., are given. The cost of the entire block is about £7,000, and has been carried out by Mr. J. O. Richardson, Albert Works, Peckham, S.E., from the designs and under the superintendence of Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, architects, 5, Clement's Inn, Strand, W.C.

WESTFIELD-ON-SEA. The foundation-stone laying of the new United Methodist Free Church, Westfield-on-Sea, took place on the afternoon of September 21. The church is designed in Late Perpendicular Gothic, freely treated, and is faced with white (Ossesey) bricks. The roof is covered with green slates. The main gable is flanked on the one side by a dwarf octagonal turret, and on the other by a bold square tower, the latter terminating in a spirelet of quaint design. The church is designed for future deep double transepts, but these are at present only to be erected to a depth of a few feet. A large school and classrooms are provided for in the future. The present portion is being erected by Messrs. Hatley, Sons, and Holmes, 21, Old Kent-road, S.E. The architects are Mr. and Mrs. J. W. R. Glave, who designs were accepted in a recent competition, are Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, 5, Clement's Inn, Strand, W.C.

WEST BRIDGEFORD, NOTTINGHAM. The dedication of the new portion of the Lady Bay Mission Church, West Bridgeford, was performed on Tuesday by the Bishop of Loughborough. The temporary iron church, with seating accommodation for 170 persons, was erected three years ago, and the first portion of a permanent edifice has now been completed, and will be used in conjunction with the western portion of the iron structure for the present. The extension consists of a nave and small chancel, 56 ft. in length, and 28 ft. wide, giving, with the old building, a total length of 80 ft., and accommodating 350 persons. The building is of red brick, with stone facings. The nave has an open roof, with semi-circular pitch-pine principals, and the chancel is of red brick, with a high nave and windows of the nave are fitted with leaded lights. The extension has cost £500. Mr. W. R. Glave, A.R.I.B.A., Low Pavement, Nottingham, was the architect, the builders being Messrs. W. H. and J. Simons.

WOLVERHAMPTON.—The executive committee appointed to arrange for the holding of the Arts and Industries Exhibition at Wolverhampton next year have already accepted the tender of Mr. J. Lindsay Jones at £10,575 for building the industrial hall, and they have now accepted the tender of Mr. J. Herbert, builder, of Hartley-street, Wolverhampton, to erect the machinery hall at a cost of £7,297. It is expected that the hall will be completed in four months' time. It will adjoin the industrial hall, and will be 350 ft. in length and 130 ft. in width, with a three-span roof. The chief decorative features will face the industrial hall. The frontage to the park will be erected in a style similar to that of the industrial hall, and inside the visitor will have an unbroken view except for two rows of columns carrying the roof of the centre bay. Arrangements are being made for the erection of a concert hall, and other attractive structures, including a Japanese pavilion. Many leading engineering and machine-making applications for space for a large display, including the manufacturers of electrical machinery and appliances and builders of the most recent high-speed engines adapted for such purposes. Arrangements have also been made to show in actual work examples of the German water-tube boiler, and also the new type of water-tube boiler, which is now so largely used in the United States, the rights of manufacturing which have lately been acquired by boiler-making firms in England. In the industrial section it appears that an interesting exhibit will be made by the Birmingham and District Industrial Society. The inaugural ceremony in connection with the building operations will be performed by the Earl of Dartmouth on October 17.

In our notice of the National Physical Laboratory, Bushey Park, Teddington, London, on the 29th inst., it should have been mentioned that the floors in connection with this building have been made by Messrs. R. and J. Lowe's patent pitch-pine w.t.-block flooring.

ARCHÆOLOGICAL.

IRBY CASTLE.—Investigations, prompted by some remarks in a book published by the late Duchess of Cleveland, have just been made in the private chapel at Irby Castle, by Messrs. J. P. Pritchett and Sons, architects, of Darlington, which have resulted in several interesting discoveries. One of these is the opening out of an ancient two-light window, in a wall 10 ft. 5 in. thick. A beautiful six-light window of the 14th century, about 14 ft. wide and 8 ft. high, has also been found wallied up in the solid masonry. The sill, head, jambs, mullions, and tracery are in almost perfect preservation. This, in the opinion of the architects, was an open screen or unglazed window, opening from the chapel into the hall, and was no doubt intended, as the chapel would be too small to contain all the household and retainers, to enable the people in the hall, or general living room, to participate in the services which were performed before the Reformation at the altar apse. The other discoveries include a 14th-century doorway, a beautiful three-light window of 13th-century work, which was also, apparently, an open screen and opened into a small chamber, probably a private chapel or pew of the lord and lady of the castle, and a 14th-century ambo, or pulpit, carved in oak, with Sacramental vessels. The ambo was found in a nearly perfect condition in the east wall. Lord and Lady Barnard have shown the greatest interest in the discoveries. The fittings of the chapel are being rearranged, and a scheme of redecoration is being carried out.

CHIPS.

A tower is about to be added to St. Mary's Church, Outlands Park, Weybridge, at a cost of £2,500, provided for by a bequest from the late Mr. H. E. Burgess.

There has been added to the collection of pictures in the Museum at Derbyshire a painting of the south-west angle of the Cathedral as seen from the Palace grounds, by the late Dean Ingham. It bears the signature "William Cleland Ingham, 1897," and is an excellent testimony to the late Dean's artistic ability.

Messrs. Stephens, Batow, and Co., Ltd., of Bristol, have been entrusted with the erection of the new church of Holy Trinity, Kensington, S.W., from designs of Mr. George F. Bodley, A.R.A. The drawings were on view this summer at the Royal Academy, and the cost of the building is £29,000, and is to take the place of the church of the same name at St. George's-place, Knightsbridge (soon to be demolished). This latter church was, until quite recently, unique in its surroundings from the fact of its having a public-house on either side of the western entrance.

An automobile street sweeper was recently tested in Hartford, Conn. It runs on four rubber-tired wheels, and is fitted with a boiler, a 12 H.P. engine for propulsion, and one of 6 H.P. for driving the brush. The latter is 6 ft. in diameter and 7 ft. long, and revolves under a hood at the back of the frame. The brush sweeps the dirt into a box holding a ton, and the exhaust steam is turned to dampen the refuse.

The Bishop of Rochester, on Thursday last week, dedicated the new church of St. Thomas, Telford Park, Streatham Hill. The building, which is not yet finished, will, on its completion, have cost £12,000.

The Teignmouth Urban District Council decided on Monday to promote a Bill in Parliament enabling them to obtain a water supply from Dartmoor.

The building scheme in connection with the parish of St. Margaret's, Leeds, is from its novelty attracting special notice. The vicar-designate, the Rev. A. Hingston (Leek) has intimated for the foundation for the new wing to the schoolroom are now ready. These have been prepared by voluntary workers, not a single expense being expended in labour, and the building is now being commenced. The plans, bricks, and a four-light leaded window were all given free, and now many workmen of different trades, and members of the congregation are engaged in erecting the school wing.

The Bishop of Worcester was the preacher at St. Paul's Church, Abchurch-lane, on Sunday last, when a new reredos was unveiled. The screen is the work of Messrs. Harry Hems and Sons, Exeter. It has a framework of Caen stone, and is surmounted by a trefoil arrangement of the same. The panels being plain. The central panel represents the Crucifixion of Christ, with Mary Magdalene at the foot of the cross, while the figures of Christ's right hand are raised in blessing Mary. The base of the panel is of gold mosaic. On either side are heavy tapestry curtains.

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ILLUSTRATIONS.

NORTH-EAST LONDON INSTITUTE—CHURCH OF ST. PETER, OYSTERMOUTH.—CHIMNEYPIECES, BELTON HOUSE, GRANTHAM.—INFANTS' SCHOOL, CRESSWELL, DERBYSHIRE.—RESIDENCE AT NEWARK.—"L'ART NOUVEAU" FURNITURE.—THE "POPINJAY," ROSEBANK, LANARKSHIRE.

Our Illustrations.

THE NORTH-EAST LONDON TECHNICAL INSTITUTE.

The design illustrated is that by Mr. Arthur W. Cooksey, of 4, Adam-street, Adelphi, and was awarded the first premium in a limited competition recently held, Mr. Thomas Blashill acting as assessor. The remaining competitors were Mr. A. W. S. Cross and Mr. E. W. Mountford. The present building is the second of its kind, forming part of the Sir John Cass foundation, the first having been recently erected in Jewin-street. Although from the designs of the same architect. It will form the latest addition to the London Polytechnic Institute, and will be immediately erected in part upon an excellent site adjoining Hackney Downs Station. The building provides accommodation for instruction in science, art, music, literature, commercial subjects and certain branches of technology, and upon the north-east corner of the site there is to be a large public hall. The building is designed in the same architectural style as the one previously referred to in Alldgate, and there will thus be a strong recognisable family likeness between them. The materials to be employed are red facing bricks, with Portland stone dressings, and Cumberland slates for the roofs. The building will be erected in sections, commencing with the science block at the rear, finishing with the public hall when funds for this become available.

ST. PETER'S CHURCH, OYSTERMOUTH.

This church, of which the foundation-stone was laid last week, is intended to serve the district of Newton and Langland, in the parish of Oystermouth, near Swansea. The illustration which we give shows the work, which is being erected from the designs of Mr. E. M. Bruce Vaughan, F.R.I.B.A., of Cardiff. The first corner stone is let to Mr. A. J. Howell, of Cardiff, for £4,700, and will afford accommodation for 400 people. Ultimately it is to provide sittings for 634 people, and will cost £8,000. The dimensions of the church are as follows:—Nave 23ft. by 28ft. 6in., north and south aisles 7ft. 6in. by 11ft. 4in., tower (inside measurement) 12ft. by 12ft., choir, vestry (by 13ft., priests' vestry 16ft. by 13ft., organ-chamber 15ft. by 16ft., and chancel 36ft. 6in. by 25ft. It has been found necessary to obtain the stone for the building from Bridgend, and the church will be faced inside and out with green and white quarrel. A portion of the church will be dedicated as a memorial to the late Miss Frances Ridley Havergal. The drawing reproduced herewith was shown at the Royal Academy this year.

TWO CHIMNEYPIECES, BELTON HOUSE, GRANTHAM.
(See review of "Later Renaissance Architecture in England," on page 412.)

INFANTS' SCHOOL, CRESSWELL, DERBYSHIRE.

The Infants' School here illustrated has been carried out for the Duke of Portland and the Bolsover Colliery, and consists of the conversion of the old schoolroom into a central hall, adding a bay window and other details, also in gaveling new class-rooms to accommodate 240 children, cloak-rooms, and other necessary accommodation. The old mistress's cottage has only been very slightly altered. The old school was erected with the local stone, and the additions have been carried out in brick with local stone dressings, the roof being covered with green slates, the windows with green shutters and lead lights. The architects are Messrs. Brevill and Baily, of Nottingham and Newark-on-Trent. This and the following drawing were shown at last summer's Royal Academy Exhibition.

RESIDENCE, LONDON ROAD, NEWARK.

This house has been erected from the designs of Messrs. Brevill and Baily, architects, of Nottingham and Newark. We have previously published a description of it when we illustrated the entrance front in our issue of July 28, 1899.

"L'ART NOUVEAU" FURNITURE IN THE VICTORIA AND ALBERT MUSEUM.

We have little to add to what has already been said as to this furniture from the Paris Exposition, and now on view at South Kensington. Our previous illustrations appeared among our plates on the 18th inst. The present subjects are an Armchair with figured leather back by Eckmann. The inlaid Cabinet made by Majorelle and Nancy is a really remarkable piece of intarsia work with nymphs bathing on the banks of a stream amidst trees and foliage, all rendered in natural coloured woods treated as a landscape panel. The Commode is also delicately inlaid by Perol Frères, of Paris.

THE "POPINJAY," ROSEBANK, LANARKSHIRE.

This building has lately been erected for the Knight Hon. Lord Newlands. "Rosebank" is near Tilletstown Castle, and is one of the prettiest villages in the Clyde Valley. The name is derived from Scott's novel, "Old Mortality." It is in this district that the game of "popinjay" was played a century ago. The drawing was exhibited at the Glasgow Royal Institute. Mr. Alex. Cullen, F.R.I.B.A., of Hamilton, N.B., is the architect.

CHIPS.

An addition to the Wennington-road schools of All Saints' Parish, Southampton, was opened by the Earl of Lathom last week. The building, designed by Mr. Jones, architect, of Southampton, consists of a schoolroom, with three classrooms, having separate exits. They may all be thrown into one for parochial purposes, and will then accommodate 800 persons.

The Lord Mayor of Liverpool has recently formally opened the new Walton and Kirkdale Technical Institute, Carisbrooke-road. The building, which is of red brick, with stone dressings, is situated at the corner of Goodall-street and Carisbrooke-road. The lecture-hall is capable of seating 250 students.

A new workhouse infirmary is about to be built at Kilmarnock. The contractor is Mr. J. Craeknell, of Peterborough, and the clerk of works Mr. William Hall, of Lyons.

The Central Theatre at Northwich was reopened last week after partial reconstruction carried out by Mr. William Molynieux, a local builder.

The Dean of Lichfield proposes to fix the carved capitals of the arches in his cathedral with statues to be executed by Mr. C. E. Kempe. The retables was designed by the late Sir Gilbert Scott, and the present works are to be carried out under the direction of Mr. G. F. Bodley, A.R.A.

The Bingley Urban District Council have accepted tenders for the erection of a new covered market in the Main-street. The proposed structure will span the open space between two shops in the centre of the town, near to where the old market-house stood. The length of the building will be 100 ft., from back to front 37ft., and the height to the eaves 12ft. It will abut on the Main-street, and will be open the full length at the front, and closed at the back, save for 18ft., to make a through road to the rear. The building has been designed by the surveyor, Mr. H. Bottomley.

A new parish hall and reading-room is about to be built at Cowbridge-on-Tyne, from plans by Mr. C. S. Errington, of Newcastle. A site has been granted by the Duke of Northumberland for a new hall, to consist of a billiard-room, news-room, recreation-room, parish-hall, ante-rooms, and caretakers' premises.

COMPETITIONS.

HANDSWORTH, BIRMINGHAM.—At the last meeting of the Handsworth School Board, the General Purposes Committee reported that Mr. F. A. Gwatkin, architect, of Birmingham, who had been appointed assessor in reference to the designs for new schools in Grove-lane, had given his award in favour of the designs sent in under the *nom de plume* "Duke of York," and as they turned out to be those of Messrs. Wood and Kendrick the committee recommended that they be accepted. This award to a member said for a long time it had been felt that the office accommodation for the Board was utterly inadequate, and that more commodious premises should be found, and they recommended that Messrs. Wood and Kendrick be also asked to prepare plans for new buildings to be erected as speedily as possible. This was likewise agreed to.

LIVERPOOL CATHEDRAL SCHEME.—The committee who have in hand the project for the erection of a cathedral in Liverpool met on Monday in the Diocesan Church House, South John-street, in that city, Mr. Robert Gladstone occupying the chair. At the close of a lengthy discussion it was decided, on the proposition of Earl Derby, seconded by the Bishop, Dr. Chavasse, that the style of architecture should be Gothic. Earl Derby moved, and Mr. Douglas Horsfall seconded, a resolution to the effect that advertisements should be inserted in professional journals, inviting architects to submit to the committee portfolios of ecclesiastical structures erected by them, those to be sent in not later than Dec. 1. The contents of the portfolios will be examined by the committee, who will then choose a limited number of architects to enter into competition to prepare designs for the cathedral. Subsequently the Organisation Committee met, Bishop Chavasse presiding, when the Ven. Archdeacon Madden was elected chairman.

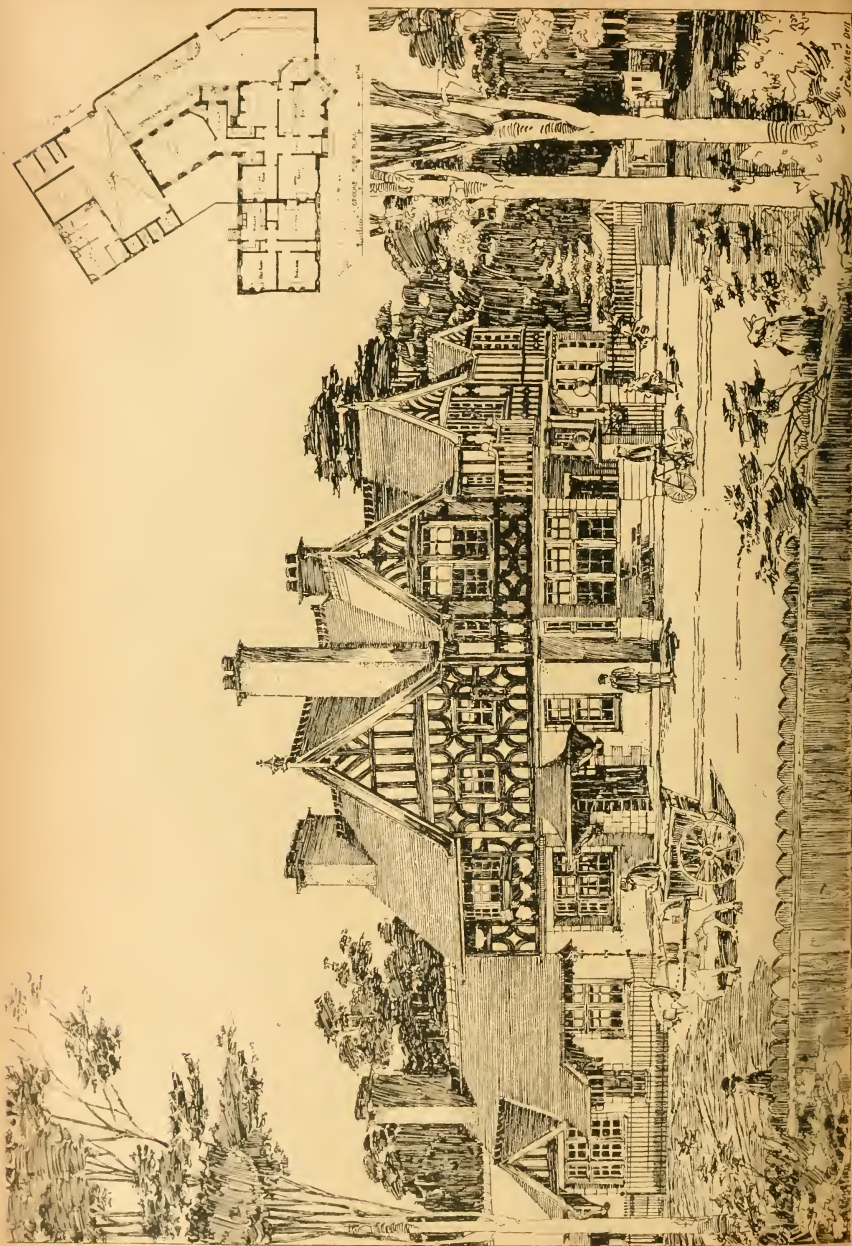
PERTH, WESTERN AUSTRALIA.—The awards by the assessor, Mr. Walter Vernon, of Sydney, the Government architect for New South Wales of both Houses of Legislature, have been made for the new Houses of Parliament at Perth, W.A. The joint committee, on Mr. Vernon's recommendation, disqualified all competitors owing to the excessive cost of the proposed buildings, and recommended that half the prize be awarded, viz., £50 and £250 to the three best designs. The first prize went to Messrs. H. Teasdale, W. B. Hardwick, W. Wilkinson, and A. Pfeffer, of Perth. The second was awarded to Messrs. G. Wallace and F. Clark, of Adelaide, and the third to Mr. W. Beebe, of Mitchell-street, Bendigo. Twenty-seven designs were received.

A provision of Rs.7,000 was made in the Madras budget for the current year for experiments in connection with experimental bacterial filters in the Robinson Park sewage farm in Madras; but the grant has been surrendered, as there was no one to supervise the experiment properly, and experiments in Bombay had sufficiently cleared up doubts on the subject.

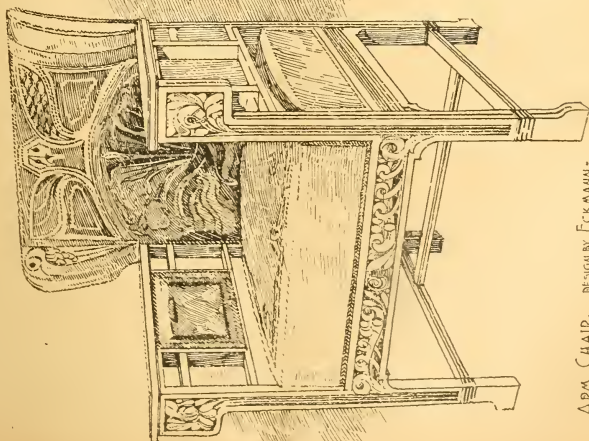
In addition to the new centres which have been provided for cripples, the London School Board has now in course of erection at Anerley a school for defective deaf boys and girls. It is proposed to erect in the suburbs four cottages to accommodate fifteen each, together with a central school. The institution is for children who cannot be properly instructed in the oral system.

A memorial window erected by the friends of the late Captain J. K. Maguire, of the Royal Sussex Regiment, in Bangor Parish Church, County Down, has been unveiled by the Marchioness of Dufferin and Ava. Captain Maguire, who was killed in action at the Battle of Diamond Hill, Pretoria, on June 12, 1900, was a son of the late Lord Dufferin. The subjects are Job addressing his soldiers and Christ in conversation with the Sisters of Lazarus. The parish church also contains a memorial window to the Earl of Ava, the eldest son of the Marquis of Dufferin, who was killed at Ladysmith.

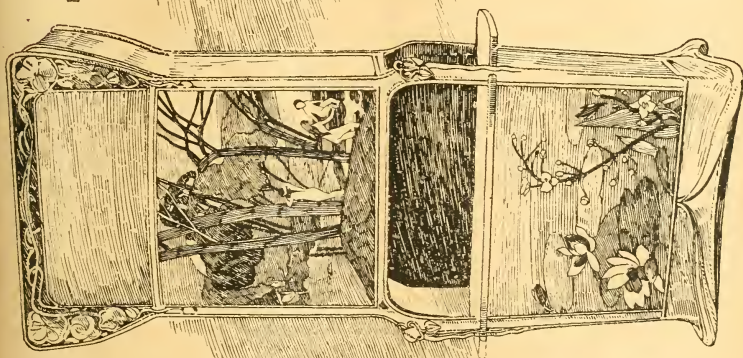
The Theatre Royal in New-street, Birmingham, is about to be reconstructed. The old theatre afforded accommodation for 2,800 people, and its successor will provide seats for 4,000 people. The pit is to be constructed to consist of a balcony. The dress circle, which now comprises four rows deep, will have fifteen rows, the accommodation in the other parts of the house being extended in proportion. In addition to the two tiers of boxes on each side of the stage on a level with the dress circles and upper circle there are to be five "family compartments," at the rear portion of the two circles.



"L'ART NOUVEAU" FURNITURE
IN THE VICTORIA AND ALBERT MUSEUM

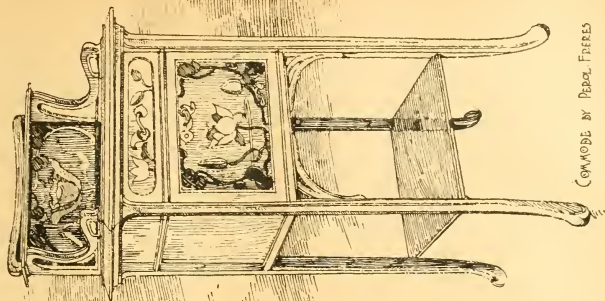


ARM CHAIR DESIGN BY ECKMANN.



WARDROBE MADE BY MARGUELLE or HANCY.

FROM THE PARIS EXPOSITION.



COMMODOE BY PEROL FIRES
OF 1889.

Engineering Notes.

THE CITY AND SOUTH LONDON RAILWAY.—The tube railway is now being extended to Islington, and the new line will be opened for traffic on Nov. 1. As the pioneers of electrical underground travelling in London, the Company completed the first section of their undertaking in December, 1890, when they opened the line from Stockwell to the Monument. In February, 1900, the railway was carried from London Bridge to the present City terminus in Moorgate-street, the Monument Station being abandoned, and in June of the same year the southern extension was completed as far as Chapham Common. From Moorgate-street to Islington the distance by rail will be a mile and a half, and with this section the total mileage of the Company is 6½ miles. Between Moorgate-street and the Angel at Islington stations are to be opened at Moorgate-street and City-road. The City and South London line will have subway connections with the new Great Northern and City Railway, at Moorgate-street and at Old-street. There is already a subway from the Bank Station to the Central London Railway, and simultaneously with the opening of the extension to Islington the Company will bring into use at London Bridge a subway giving direct access from their line to the London and Brighton Company's station. The Islington terminus is contained in an iron-bound tunnel of the same size as the Chapham Common, namely 30ft. diameter, and the island platform carries provision for trains consisting of four coaches.

SALFORD.—Great progress has recently been made in the application of electric power to the Salford corporation tramways, and the experimental trial of a car has been made along Salford-road. The Board of Trade, upon information that the Higher Broughton route is nearing completion, and it is expected that the inspection will soon take place. The cars for the electric service, which will be lighted inside by six electric lamps, will carry 56 passengers, 22 inside and 34 outside. The completion of the building which the corporation are erecting in Frederick-street to be used as a generating station is also being pushed forward. A car shed is being built in Salford-road. The structure is of red brick, with stone dressings, and there are eight entrances. It covers three acres of land, and will cost about £50,000. The shed is divided into four bays, and will be used for accommodation for 180 cars. Across the end of the bays traverses are to be placed, and these will be used for the purpose of transferring cars from one bay to another. Each bay is 60ft. wide and 350ft. long, and the building also comprises a repairing shop, smithy, and paint shop, and stores. These will be 180ft. long, and will vary in width.

The prolonged strike at Lord Peunry's slate quarries at Bethesda is practically at an end, as the management are daily receiving applications for re-employment upon the same terms.

At a special meeting of the Hyal Urban District Council held on Monday in consequence of the burning of the grand pavilion a week previously, a special committee was appointed to at once engage an architect to draw plans for a new pavilion.

A large clock has just been erected in the parish church of Little Radford, Leicestershire, by John Smith and Sons, Midland Clock Works, Derby. It shows the time on one large dial, and strikes the hours on the largest bell.

The additions to the infectious hospital, Bucknall, Staffs. are being warmed and ventilated by means of Shortland's patent Manchester stoves, with descending smoke-flues, and patent Manchester grates, the same being supplied by Messrs. E. H. Shortland and Brother, of Manchester.

In the case of the application on behalf of William Savage (carrying on business under the style or firm of J. W. and W. Savage), St. Alban's, builders, the order of discharge from bankruptcy has been suspended for two and a half years, ending Feb. 19, 1902.

The Bishop of Oxford will visit High Wycombe on October 9, instead of the 2nd, as previously announced, to lay the foundation-stone of a new church in St. John's district, which will cost £5,000.

Mr. Carnegie has agreed to give £2,500 to Ilkesham for the erection of a suitable free library, on the condition that the town council provide the site. The Free Libraries Act was adopted only recently in the borough.

PROFESSIONAL AND TRADE SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—This association has acquired new rooms, and the address in future will be 117, George-street, Edinburgh.

NORTHERN ARCHITECTURAL ASSOCIATION'S EXCURSION TO SUNDERLAND.—On Saturday afternoon the members of the Northern Architectural Association held an excursion meeting, the place visited being Sunderland. Among those present were Mr. Frank Caxs (president), Mr. P. B. Plummer (hon. sec.), and Messrs. Errington, Bruce, Oliver, W. Milburn, T. Milburn, Grieves, Shepherd, Stephenson, Stratfield, and Stott. The party visited the new pier works, by the permission of the Commissioners' engineer, Mr. H. H. Wake, M.L.C.E. Mr. Wake, in his unavoidable absence, had deputed Mr. Herring, the assistant engineer, and Mr. Smith, the resident engineer, to conduct the party, and the constructive details were explained by these gentlemen. The architects also went through Messrs. Butterell and Roche's new premises, West Sunniside, designed by Messrs. Henderson and Hall, and finally visited the Reddy House Board Schools, designed by Messrs. Barnes and Coates. For both of these buildings the plans were exhibited and explained in detail by the architects' representatives.

CHIPS.

Earl Roberts will unveil on Thursday, Oct. 10, the statue of Queen Victoria which has been erected on the Infirmary Esplanade, Piccadilly, Manchester.

The Charles II. memorial stone at the entrance to Lee-lane, Bradpole, near Bridport, was unveiled on Monday, on the 25th anniversary of the fugitive King's escape from Cromwell's troops, by turning down the lane on the afternoon of September 23, 1651.

At the parish church of St. Michael's, Wood Green, on Sunday, two stained-glass windows were dedicated to the memory of Queen Victoria. The memorial was subscribed for by members of the congregation and children attending Sunday and day schools. The windows represent "A good woman who, having laid down her earthly crown and sceptre, receives at the hands of our Saviour a crown of glory."

Count Suzor, the President of the Russian Theatre Safety Commission, who is now on a visit to London, inquiring into the effect of our regulations, was entertained at luncheon at the Carlton Hotel, on Monday, by Mr. Edwin O. Sachs, Chairman of the British Fire Prevention Committee, to meet the Chairman of the Sub-Committee, the Chief Officer of the Salvage Corps, and other experts on the subject.

Memorial-stones of the Victoria Wesleyan church in Bolton-road, Newtown, Pendlebury, were laid on Saturday. The church, which will cost about £1,000, will accommodate nearly 600 people.

On Monday week, October 7, the Hon. Lyulph Stanley will open a new Board School in Countess-terrace, Whitegate, on the following Tuesday one in Christian-street, St. George's.

A Runic cross has been erected at Ship-hill, Chobham, as a memorial of Queen Victoria, and it was unveiled by Lady Le Marchant on Wednesday. The cross, which is of polished Aberdeen granite on an ironstone base, together with a cross used in the Crimean war, has been placed on the common at Chobham, where, on June 21, 1855 the late Queen reviewed her troops before they left for the Crimea.

At a meeting held in Newcastle-on-Tyne on Friday, it was resolved, on the motion of the Duke of Northumberland, to commemorate the public services of the late Lord Armstrong by the erection of a statue, and the completion of the buildings of the local College of Science.

An undenominational college on the South Cliff, Scarborough, was opened on Friday. The cost of the building and site has been about £11,385, and when the grounds are laid out the approximate total cost will have been £15,000. The accommodation of the building is for 100 boarders. We illustrated the college from the designs of the architects, Messrs. Hall, Cooper, and Davis, of Westminster and Edinburgh, in our issue of August 12, 1898.

The Earl of Jersey and Colonel Boughiey, Light Railway Commissioners, held a meeting on Monday on an application by the British Electric Traction Company, Ltd., for an order to construct light railways within the borough of Crewe, and to the borough to be known as Trentham, owing to the opposition both of the corporation and of independent ratepayers, the commissioners refused the application.

STAINED GLASS.

DUNELME CATHEDRAL.—The great east window of Dunelme Cathedral, which has been fitted with stained glass, was unveiled on Monday. This is the first stained glass window in the structure, and is a memorial to the judgment hall of Plale, the Agnus Dei, his mother. The window contains four lights, each 32ft. in height, and eight pictures, representing the Crucifixion, the bearing of the cross to Calvary, our Lord's journey to the Mount of Olives, his death in the garden of Gethsemane, the Charge of St. Peter on the Sea-shore, the Supper at Emmaus, the Appearance of Mary Magdalene, and the Burial of our Lord. The window is 100ft. high, and contains the figures of Old Testament prophets who were foretold our Lord's passion and death. The tracery openings show figures of adoring angels, shields of the sacred monogram, ornamental wreaths, roses, &c. The work was carried out by Mr. C. E. Kempe, London.

We regret to hear that Sir Alexander R. Binnie, who is about to retire from the position of engineer-in-chief to the London County Council, has sustained a severe attack of the palsy, which he has, Lady Binnie, who died on Saturday last at their residence in Ladbroke-grove, was a daughter of the late Dr. Farnes, of Londonderry, and was married to Sir Alexander Binnie in 1865.

The foundation-stone of a grammar school for girls is being laid in the Glebe-plot, Lambing-lane, on Monday week, by the Marchioness of Bristol. The school is to be built from the funds of Mills Charity, from plans selected in competition so far back as 1892, reported by the Rev. Mr. Brown, Princes-street, Ipswich. The delay has resulted from the loss of funds owing to agricultural depression in East Anglia, and this has evidently led to the curtailment of the scheme. Accommodation will be provided in the present block for 40 pupils instead of 112 originally proposed. Messrs. George Grimwood and Sons, of Ipswich, are the builders.

There was a decided improvement in business at Tokenhouse Yard last week. The total of the sales for the week amounted to £42,139, as compared with £44,748 for the corresponding period last year.

Halifax to Southwartham tramway was formally opened on Monday afternoon. It commences at the Town-hall corner in Broad-street, and then runs on to about half-way up New Bank, where it branches off along Beacon Hill-road, the present Southwartham terminus being opposite the Cock and Bottle Inn.

At the Town-hall, Darlington, Mr. W. O. E. Mather, M.P., has been asked to apply for the application of the Darlington Corporation for powers from the Local Government Board to borrow £12,250 for electric lighting purposes, and £14,000 for gas-works.

The extensive works of Messrs. Alex. White and Sons, builders, 25, Cornhill, Liverpool, were partially destroyed by fire on Sunday morning.

The well-known landscape painter, Professor Karl Ludwig, whose death is announced, was born in 1839, at Romhild, in Saxe-Meiningen, studied painting at Munich, under Fritschy. He was the first model at the International Art Exhibition in Vienna in 1873, and four years later was appointed professor of painting at the Royal Academy in Stuttgart. He resigned this position in 1877, and returned to his native town, where he was well known both as a teacher and a painter.

The electric-supply works of the Walthamston Urban District Council were formally opened on Friday. The generating-station, situated in Exeter-terrace, Colton, and which will cost £10,000, covers an area of land. There is already a demand for private lighting equal to nearly 15,000 eight candle-power lamps; the principal streets are lighted by 63 are lamps, each of 1,400 candle-power, and 6 are lamp columns, two life-candle-power glow-lamp being attached for use after eleven o'clock at night and in the side streets the gas-jets will be replaced by glow-lamps. Specifications are being issued for the laying of the cables at a distance of 100 miles, and provision has, therefore, been made for adding to the capacity of the new works. The scheme of the council will, when complete, have cost £250,000.

Mr. Talford Ely writes that in the Towns Field, North Haying, he has this year excavated a larger space than before, showing the foundation and outline of several connected portions of a large Roman wall. The wall was built by the Romans for a few days, till the ground is ready for farming purposes. He has found few objects of interest. Fragments of fluted terracotta suggest architectural decorations, and five tiles indicate the method of warming.

Mr. Walter Medd, county surveyor for the North Riding, has intimated to the Starforth Rural Council that he will retire from his office on the 15th of next November.

WATER SUPPLY AND SANITARY MATTERS.

KILMARNOCK.—The new waterworks just completed at Craigendunton, on the Forcnick Moor, about eight miles from Kilmarnock, were formally opened on Saturday. The water supply undertaking was acquired from a private company in 1892, and to meet the growing wants of the community a new reservoir was projected. The operations have occupied nearly six years. The water supply was designed by Messrs. Leslie and Reid, Edinburgh, and after the death of the senior partner of that firm, Mr. Wilson, the work was taken in hand by Mr. Niven, C.E., Glasgow, by whom it has been carried through. The reservoir covers an area of about thirty acres, and its greatest depth is about 40 ft., while the storage capacity is 135 million gallons, the source of supply being the Dunton Burn and its tributaries. The total cost of the undertaking, including price of land, piping, and three large filters and a clear water tank at Anlaurd, has been £62,000.

CHIPS.

The foundation-stone of a new girls' high school was laid at Prestwich, N.B., on Monday last. The architect is Mr. Eggleston, of Ayr.

At a meeting of the Museum and School of Art Committee of the Birmingham Corporation on Tuesday, it was announced that Mr. John Evans had presented to the Art Gallery six valuable and interesting cartoons by Sir Edward Burne-Jones. These cartoons, each 6 ft. in height, represent King Robert Bruce, David, Earl of Huntingdon, Sir William Wallace, Robert the Bruce, Queen Mary Stuart, and are the original designs for the stained-glass windows in the Bunder Fresco Library. Mr. Evans's gift is a welcome addition to the already valuable collection of cartoons and drawings by the great Birmingham artist. They are now on view in the Art Gallery.

The Portsmouth Electric Tramways, which are upwards of fourteen miles in length, were formally inaugurated on Tuesday. The contracts for relaying the lines, overhead wires, and power station represent upwards of £280,000, and, with the amount to be paid for the acquisition of the old system, the Corporation has incurred an outlay of £600,000.

Lord Avebury laid, on Tuesday, the memorial-stone of the new technical schools which are in course of construction at Southampton, from designs by Mr. Henry T. Hare, F.R.I.B.A. The buildings occupy a central site at the junction of London-road and Victoria-avenue, and the accommodation will comprise a complete model school for about 400 persons, physics and chemical laboratories and demonstration-rooms, as well as ordinary classrooms, and a very complete art school. The estimated cost of erecting, equipping, and furnishing the new schools is £150,000, exclusive of the site, which forms part of the land belonging to the corporation.

The ceremony of opening the new Baptist chapel at Moutnary, which has lately been erected by Messrs. Hughes and Son, of Southampton, from designs by Mr. F. H. Shaylor, took place last week.

On Saturday afternoon the Wallasey Urban District Council's new technical school in Rowson-street, New Brighton, was formally opened. It has been built from plans by Mr. W. H. Travers, surveyor to the council.

At the town-hall, Warrington, on Friday, Mr. North, Local Government Board inspector, conducted an inquiry into the application of the Corporation for sanction to borrow £15,000 for electrifying purposes. It was stated that the existing demand for the electric light necessitated further extensions. The station was opened in December last, and the amount expended on it up to the present was £10,000.

At Larkhill, N.B., the townspeople have decided in favour of the adoption of the Free Laverick Act. Mr. Carnegie has promised £5,000 towards the cost of the building, and a local landowner has offered a site adjoining the Dobbin Hall.

The foundation-stone of the new Episcopal Church for Lockwood, was laid on Saturday. The new church is situated in Ash-burn terrace, and is Early English in style. The estimated cost is about £14,000, and there will be accommodation for seating 150.

On Sunday, in the parish church, Cadeion, a memorial to the memory of the fourth Earl of Cadeion, K.P., was unveiled. The memorial, which is a redolent stone, extends across the base of the chancel wall low, and is supported at either end by a single Corinthian column. The memorial is of marble upon which it is the centre.

The scheme for supplying Belfast with water from the Killeel and Annalong districts of the Mourne Mountains entered on its final stage on Tuesday week, when the new supply was turned on in the County Down side of the Lagan.

Our Office Table.

ECCLESIASTICAL dilapidations were discussed at great length on Tuesday at a rural dean's conference held at the Chapter House, Bristol Cathedral, the Rural Dean, Canon Walter C. Pridmore, the Ecclesiastical Surveyors, and the topic, remarking that the question was what manner of dealing with dilapidations in vicarage houses would have to be adopted, as he thought they must all view the present system as not satisfactory. He did not, however, think they should condemn the diocesan surveyors, as they were paid to carry out a very difficult task. They had to do justice, and in such a way as to please two parties, the outgoing and incoming tenants. He thought there were two principal injustices under the present system. An incumbent might suddenly find himself called upon to settle dilapidations which had been going on for a long time because the moment came when the work should be done. An incumbent might manage to keep outside the five years' system, and his successor, if there was no estate, had to carry out repairs. There might be some fixed charges made, so that they should not have to face enormous repairs or to go into parishes where they had to carry out all the repairs themselves. There were two schemes at present brought forward, one introduced by the Rev. D. J. Davies, of contributions based on the annual value of the vicarage house, and the other by Mr. A. de la Beck, of Worcester, in connection between Queen's Anne's Bounty and the Ecclesiastical Commission to contribute £100,000, as a nest egg. The Rev. A. N. Scott read a paper on the subject, in which he referred to points in the existing Act which were objectionable. In the first place, one of the duties of the rural dean or surveyor and the bishop's secretary. Secondly, diocesan surveyors were sometimes thought to order unnecessary work to be done, which was very trying to the person who received the order. Thirdly, the surveyor might underestimate the cost of the work, in which case the incumbent had to provide the surplus. Fourthly, benefices with small endowments might be saddled with expensive buildings, kept in order without much difficulty in prosperous days, but forming now a grievous burden. Fifthly, the sum due to the incumbent might be too small to enable him to get incumbent or his representatives, and that knowledge might not come till the new man was inducted, and so he became liable. Of the schemes spoken of by the Rural Dean, that of the Rev. G. J. Davies made the benefice liable, and the incumbent alone responsible. Mr. Pridmore had suggested in a malediction of the Ecclesiastical Commission and Queen's Anne's Bounty, and that the new authority thus formed should be given power to deal with all dilapidations. The leading points of this were that it was a great central scheme, not a diocesan scheme; that it was administered by a rich body; the payments were according to the net income of the benefices; and there were no fees to be paid by the incumbents. The advantages of the scheme seemed considerable. Canon Griffiths said the second scheme looked very fair, but many points would need to be considered. The clergy would be liable in the towns most of them would have to pay about £25 a year to that scheme, and that sum would not be expended on their own houses; it would go to help smaller livings. After further discussion the following non-committal resolution was carried: "That the question of dilapidations strongly calls for reform."

On Sunday evening, at the close of the harvest festival at the parish church of St. Mary, Irish Episcopi, just as the ringers had gone up into the tower to ring a final peal, without the slightest warning the timber gearing in the belfry collapsed. The tenor bell broke from its support, and falling upon the floor of the bell-chamber, smashed a cross-beam, and portions of the beam, weighing several hundredweight, fell into the belfry, bringing down a large amount of debris. Fortunately none of the ringers was hurt. The wood-work in the tower has for some time been in a very bad state of decay, and in the previous year a public meeting was called, at which a committee was appointed to take steps for the restoration of the tower and the renovation of the bells, and subscriptions amounting to about £180 had been promised. Owing to this untoward accident illustration of the urgent necessity for repairs, double the amount previously estimated

will be required to carry out the renovation. The tower of St. Mary, Irish Episcopi, is well known as one of the best proportioned and highly-ornamented ecclesiastical towers of the Englishshire type. It is of the Kingsbury character, in four stages, and has a rich battlemented parapet, pierced with open quatrefoils, having grouped pinnacles at the angles, with smaller ones in the centre of each front, while on the faces of the tower are small, deeply incised, cusped, and pointed shafts. The south front of the tower was illustrated in our issue of December 28, 1888, from a drawing by Mr. Harvey Pridham.

In a letter to the *Times*, Major F. A. Mahan, R.E., U.S. Army, describes the system of asphalt paving adopted in many American cities, usually Washington, D.C. The writer has been a few years since charge of the construction, maintenance, and repair of all streets and roads. The asphalt block system formerly adopted had, he says, the fatal defect of lack of homogeneity, and consequent liability to "disbishing." It is, therefore, being replaced by sheet asphalt, and in Chicago there are over 100 miles of sheet asphalt paving, and only a quarter of a mile of asphalt blocks. The sheet asphalt pavement as laid in the United States is, says Major Mahan, very different from that laid in Europe. The latter is made of an asphaltum (asphaltum) and in Chicago there are 100 per cent. of asphaltum, which, when heated, can be rolled into a solid mass. This pavement is very slippery even when dry. It was condemned in the States by an official board in 1876 as being too slippery for general use. The pavement as made in the States is a mixture of the melted asphalt from the island of Trinidad replaces the lime or cement paste. Ninety per cent. of sand of varying fineness is mixed with 10 per cent. of refined asphalt at a temperature of 300°. This mixture is spread on a specially-prepared foundation, and compressed under very heavy steam-rollers. In the States there have been laid more than 33,000,000 square yards of this pavement in 200 cities and towns. It is, indeed, according to the writer, rapidly displacing all others, and is becoming the standard pavement of that country.

The annual report of Mr. T. H. Yabbieon, the city engineer of Bristol, states that the city, as extended by the Act of 1868, covers an area of 3,398 acres and contains a population of 328,836. The length of highways is about 275 miles, and the length of sewers about 305 miles. About 101 miles of highway are lighted by electricity. The number of gas lamps is 1,763, and oil lamps 51. Building operations have been most extensive in the city, including St. George and part of St. Philip and Jacob, and southern Brislington, Knowle, and Totterdown districts, the increase in the rateable value of the latter being most considerable. During the year the total length of private streets made up was 7,984 yards, or 4½ miles, and the average cost of work done by the corporation has been £s. 0-15d. per foot of frontage. Wood paving was substituted for the former road material in 18 thoroughfares, comprising 33,997 superficial yards, at a cost of £22,193, giving an average cost of 13s. 6d. per superficial yard. The area of wood paving in the city repaired by the corporation is 190,515 superficial yards, independent of the portion maintained by the Tramways Company. The cost of maintenance of parks was £5,058, the total area of parks and open spaces being nearly 1,000 acres. The plans for the improvement of the city and the attention to existing buildings were submitted to the sanitary committee, of which number 33 were approved and 212 disapproved. The number of houses erected was 1,576, as compared with 1,591 in the previous year. Ninety street improvements were submitted for the consideration of the sanitary committee; 28 did not comply with the by-laws, and 61 were approved.

The General Purposes Committee of the Malchester City Council has considered and adopted proposals to be embodied in a new Parliamentary Bill for carrying out street, main, and tramway improvements in the Corporation, including the Corporation-street, Canon-street, Clifton-street, and other main thoroughfares, laying new lines for electric tramways, adopting powers to regulate the street traffic, adding to the electrical stations and plants, extending the boundaries of the city and other purposes.

The scheme of street improvement at Hull which the Right Hon. the Vice Lord President of the Local Government Board, will formally inaugurate a month hence, is the greatest and most

important undertaking by the corporation of that city. To reach Prospect-street from Monument Bridge people had to travel round by way of Waterworks-street and Chariot-street. Through the centre of the block of property facing Monument Bridge a road 80 ft. in width has been driven, and an uninterrupted vista from the bridge to Bevelly-road corner, nearly a mile in length, now meets the eye. Not a few old streets, containing old, worthless, and insanitary property, have been completely demolished, and their names taken off the street nomenclature of the city. The sites of the new street to be known as King Edward-street have realized large prices, several about £50 per square yard, as the thoroughfare will undoubtedly take front rank in the business avenues of Hull. On some of the sites extensive buildings are being erected, and when the new street is built up it is estimated that the value of land and property in it will amount to a quarter of a million of money; in addition to which, there will be a handsome addition to the rateable value of the city. Another improvement which will be commenced in 1902 is the demolition of the Junction-street and St. John-street block of buildings, and the formation of a great central square, measuring 272 ft. from north to south, and 216 ft. from east to west. This open square will be in the heart of the city, and a little over an acre in extent. The scheme also provides for the erection of 34 shops of varying frontages, and the provision of a public hall, with retiring-rooms, together with three large reception-halls. The present gross rental of land and buildings in connection with this improvement is £10,000. The present gross rental of the property, which belongs to the corporation, is £1,861. After the improvement is completed, it is estimated that the corporation coffers will be enriched by an additional annual sum of £3,872.

Mr. KILLINGWORTH HEDGES, C.E., was some time ago asked to report on the arrangements hitherto made for protecting Westminster Abbey against lightning. As in the case of St. Paul's Cathedral, he considered that the number of conductors was quite inadequate to the size of the building, and that they were not even in a satisfactory condition. He was, therefore, instructed to prepare a new plan. This was now complete, with the exception of the Chapel of Henry the Seventh's Chapel. From these cables are 161 small conductors to the towers, lantern, and other higher parts, and thence downward to the earth, the conductor being strained through hold-fast. The horizontal conductors are furnished with about 30 four-point copper pigsties, fixed about 30 ft. apart. To obtain low resistance from the dry sand on which the Abbey stands, a small pipe has been laid from the earth to the nearest rain-water spout, and rain-water will be deviated in sufficient quantity to keep the charcoal moist in dry seasons. A 3-in. solid copper wire, with one of the pinnacles, by which the structure is surrounded, the wire being attached to a small general conductor laid horizontally on the lowest roof, and connected with the lead roofing. The works have been carried out by the Abbey staff, under the direction of Mr. Hedges, acting as consulting engineer.

The Bristol City Council adopted on Tuesday, after some discussion, the report of a special committee on the condition of contracts. It was stated that when the report of the committee was presented to the council on a previous occasion the committee had been asked by the architects should be added to engineers as the sub-jointing authority. That had been done in the present report. The principal discussion arose on the penalty section, and the council not being satisfied with the power to enforce the penalty, had referred the matter back to the committee. In the present report the penalty clause had been re-framed, and the committee was advised that the corporation had full power to enforce the penalty. In committee another question arose. In consequence of a report drawn up by the dock engineer, it was decided to obtain further information from dock and pier authorities. This, when it was examined, brought out clearly the unique position of the Corporation of Bristol as owners and managers of the dock estate, and also showed that while

corporations of cities almost invariably inserted clauses in contracts regulating labour, some of them of a very drastic kind, port and dock authorities did not. It was pointed out to the committee that it was not always possible with dock work, especially in tidal work, to carry on contracts with the same hours and under the same conditions as in the case of the city. The committee was ultimately, by a majority, came to the decision to recommend that the regulations as to hours and conditions of labour be struck out as far as it related to the dock estate, but should be retained for the general work of the city. This was largely in the interests of fair dealing. These conditions which the committee proposed were similar to the conditions in many towns in the kingdom, such as Cardiff, Liverpool, Leeds, and Sheffield. Birmingham dealt with sub-letting only. It was found, however, by the committee, that railway companies and engineers in private practice did not insert clauses in contracts.

The Parks Committee of the Manchester City Council paid an official visit of inspection on Friday to their nurseries at Carrington Moss. About ten years since the corporation had, after a report from the superintendent, Mr. Lamb, to provide the young trees and shrubs needed for the parks and recreation grounds. Three acres of land on the Carrington Moss estate were rented from the Cleansing Committee, and Mr. Lamb was so soon able to prove that the development of the nurseries would be an economical undertaking that at the present time they cover as much as sixty acres. From the nurseries the public parks and gardens are supplied not only much more cheaply than could be the case if outside purchases had to be made, but also in much greater abundance. Trees and shrubs are thus "stand" the market price, and are grown. Amongst these are poplars, willows, privets, golden elders, birches, and rhododendrons. Some twelve thousand poplars and from three to four hundred thousand rhododendrons are now growing at Carrington. The nurseries are full of fine-limbed growth; they are so well suited to their purpose that a poplar or any other soft-wooded tree will in four years develop as much wood as would be produced in six years on the less vigorous soil in the nurseries at Withington.

As investigation of oiled roads in Southern California has recently been made by a committee of the board of supervisors of Sacramento County. In one district they found the work done by contract at the rate of one dollar per barrel of oil. The plant used included two storage tanks, together holding 550 barrels, two smaller heating tanks, an oil-burning boiler and pump for forcing heated oil into a sprinkling wagon, and small accessories. One man runs the plant exclusive of sprinkler. The oil is pumped into the tank for the first application, and to 230° or more for the second, and may be transported for 10 miles in the steel tank of the sprinkling wagon without detrimental loss of heat. In other districts, where the oil is applied cold, the cost is about two-thirds as much, but the result is not so good. In one county a public plant had been built, and been built in other districts, and another is under construction. The use of oil is widespread in Southern California, both in towns and in the country, and evokes little opposition. Particular mention is made of the good condition of a dirt road over which three to seven million loads are hauled in a beet-sugar plant. This road was graded last year, and sprinkled twice with about 200 barrels of oil per mile at each application. This is about twice the quantity generally used. The committee recommends oiling existing macadam roads and then covering them with sand or decomposed granite.

The rural district council of Titchhurst have appointed Mr. Caley, of Tunbridge Wells, as architect for the proposed new isolation hospital.

The Birmingham Board of Guardians adopted, on Friday, a report by the Marston Green Homes Management Committee, recommending the acceptance of a tender to extend farm buildings, and to erect labourers' cottages at Marston Green. The board accepted the tender, which fixed the cost at £1,305. The highest tender was £2,350, and the lowest £1,229.

The foundation-stone of a new mission church in connection with St. John's Parish, West Bromwich, was laid on Thursday in last week. The cost of the building will be £870, and will accommodate over 300 worshippers.

THE ARCHITECTURAL ASSOCIATION.
The day-school will close on Monday, 10 inst. (the evening papers are requested to forward their notices to the secretary at the above address.)
The evening school, also (HOUSE) on of THURSDAY.
A pamphlet containing the regulations for the membership may be obtained upon application to the SECRETARY, 26, Great Marlborough-street, London, W.

R. N. BALFOUR, F.R.S.E.,
17, F. MAULE & CO.,

Trade News.

WAGES MOVEMENTS.

SWANSEA.—The builders' labourers who are on strike commenced, on Monday, a vigorous picketing campaign, for which action they have been threatened with an injunction by the Master Builders' Association. At 4.30 a.m. the roll-call of the strikers took place, and a body of men at five o'clock went in the rain to the workhouse extension, where they endeavoured to stop non-strikers going to work. The police interposed, and threatened to report Mr. George Payne, a Swansea, Town Council. The strike has already cost the Gasworkers' Union nearly £2,000, and the masters have lost over £3,000.

CHIPS.

Mr. Edward Robert Burt, of Eagle Lodge, Edenbridge, and of the firm of Edward Robert Burt and Sons, of Camberwell, cement makers and lime burners, who died on July 1st, aged 77 years, has left estate valued at £21,388, including personality of the net value of £13,331.

On Saturday afternoon a new church was opened for the use of St. Paul's United Free Church congregation at Perth. The new building stands on the site occupied by the old church, with a slight extension of frontage, and is designed in the Early Decorated style. It is seated for 800, and the estimated cost is about £4,000. It is lighted by electricity.

The memorial church at Batterley, near Crewe, built at the cost of Mr. Tremlow, was opened by the Bishop of Chester on Thursday in last week. It has been built from designs by Messrs. Paley and Austin, of Lancaster, and the work has been carried out entirely by the employees on the Boleby estate, under the superintendence of Messrs. Burgess and Whitaker. The church has been furnished by Messrs. Jones and Willis, of Birmingham. Its measurements are 56 ft. by 17 ft. 6 in., and it has accommodation for about 100 worshippers in the hall of Accrington red brick, with dressings of red sandstone.

The corporation of St. Ives, Cornwall, having applied to the Local Government Board for sanction to borrow £1,000 for the provision of public slaughter-houses near the route between Nanjivy and the Stennack, an inquiry was held in the town hall on Friday morning by Colonel A. G. Durnford, R.E. Mr. J. Grenfell, the borough surveyor, produced and explained the plans.

Blucher-street U.M.F.C. chapel, Barnsley, has been closed fifteen months for alterations, costing £2,700. The chapel was reopened on Sunday. The old plain front of the chapel has been taken out and brought forward four yards flush with the street, a dressed-stone facing, in the Classic style, having taken its place. The interior arrangements have been altered, the cramped gallery seats being replaced by pews, three rows in place of four; a rostrum has taken the place of the pulpit, sixty additional seats have been provided, new heating apparatus and electric light have been put in, and the whole of the windows filled with stained glass.

At the Lincoln Diocesan Training College the Bishop of Lincoln formally dedicated on Friday the new buildings which have been added to the College, at a cost of upwards of £7,000. The college is devoted to the training of lay students, and the voluntary schools in the diocese, and the additions enable the committee to provide for about fifty more students.

Application having been made by the Selby Urban District Council for sanction to borrow £500 for works of sewerage and drainage, Mr. E. Selby, the Local Government Board sent down one of its inspectors, Mr. R. H. Bicknell, who, sitting at the town-hall, held an inquiry into the matter on Friday.

Upon the retirement of Mr. Commissioner Kerr from his position as Judge of the City of London Court, it has been decided to place in the Court a marble bust, the gift of Miss E. Malcolm Kerr. The bust, which is by Mr. J. Nesfield Forsyth, was recently exhibited at the Royal Academy, and it will be unveiled to-morrow (Saturday).

The Hayfield Board of Guardians have obtained the sanction of the Local Government Board to the erection of casual wards and other alterations and additions to the workhouse at an estimated expenditure of £5,545. The work is to be proceeded with at once.

ELECTRICAL PLANT.

Sheffield Plant	S. F. Felken, General Manager, Commercial-street, Sheffield	Sept. 31
Huddersfield—Generating Plant	The Borough Electrical Engineer, St. Andrew-street, Huddersfield	31
Poplar, E.E.—Elec. Light Installation to Four Public Libraries	The Borough Elec. Engineer, Gloucester-street, Bromley-by-Bow, E.	Oct. 1
Rochdale—Feeder and Distributor Cables	C. C. Atchison, Boro' Elec. Eng., Elze Works, Dancet, Rochdale	2
Rochdale—Six Electric Car Buses	The Town Clerk, Town Hall, Huddersfield	2
Manchester—Ampere-Hour and Hot-Water Meters	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester	2
Leeds—Laying Out Electric Cables	The Engineer's Department, County Hall, Spring-gardens, S.W.	2
Greenwich Tunnel—Electric Lifts, &c.	Harold Dickinson, Manager, Washmill-road, Leeds	2
Leeds—Feeder Cables	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester	2
Halfway Street, Sidcup—Elec. Lighting at Children's Homes	Thos. Dinwiddie, F.R.I.B.A., 12, Gosson's Hill, Greenwich, S.E.	10
Richmond—Switchboard	Kenney and Jenkin, 17, Victoria-street, Westminster, S.W.	11
Richmond—Electric Motor Cars	H. H. Hewson, M.I.E.E., City Engineer, Municipal Buildings, Leeds	15
East London, South Africa—Engine and Alternator (50kw.)	Dyer and Dyer, Municipal Agents, 17, Aldermanbury, E.C.	Nov. 25
Blackpool—Forty Arc Lamp Canopies	R. C. Quin, Borough Electrical Engineer, Blackpool	31
Barnsley—Public Bathing	John Bradley, Clerk, Broomfield, E. Rotherham	31
Blackpool—Arc Lamps	R. C. Quin, Borough Electrical Engineer, Blackpool	31

ENGINEERING.

Latterwood—Sewage Outfall, &c.	Rural District Council	Sept. 24
Reading—Tramways	John Bowen, A.M.I.C.E., Borough Engineer, Town Hall, Reading	24
Middleton—Waterworks Repairs	William Roche, Clerk, Middleton	24
Wimslow—Enlarging Tank	A. C. Cartwright, Surveyor, Council Offices, Wimslow	24
Braintree—Steam Road-Roller (10-ton)	W. B. Haynes, Clerk, Alexandria-road, Swavesey	29
Belem—Docks	The Commercial Dept. of the Foreign Office, Whitehall, S.W.	30
Edinburgh—Laying Cast-Iron Pipes 2,320 yards of 30in.	A. A. Tat, Engineer, 24, George-street, Edinburgh	30
Hircombe—Sinking Shaft	The Engineer's Office, Town Hall, Huddersfield	30
Barnsley—Oil-Engine, &c.	Taylor, Sons, & Santa Crisp, M.M.I.C.E., 27, Old George-street, S.W.	30
Kingston—Bridge over Hindwell Brook	A. Temple, Clerk, Kingston	31
West Droyon Waterworks	H. Bartlett, Surveyor, Railway-approach, Worthing	31
Barnsley—S.E.—Hydraulic Flag-making Plant	Fredk. Ryall, Town Clerk, Town Hall, Spa-road, S.E.	30
Sundul Magna—Water Mains (5,000 yards)	M. Massey, M.I.C.E., Council Offices, Bradford	30
Edinburgh—Additional Sinking Ponds	W. Tait, Engineer, 22, George-street, Edinburgh	30
Copenhagen—Bridge	Statenshaabengs Kontor, Reventagsgade 10, Copenhagen	Oct. 1
Barnsley—Water and Drainage Works	James R. Burton, M.I.C.E., 1, St. James's-street, London	1
Leicester—Pumping Machinery	G. E. Mawley, M.I.C.E., Borough Engineer, Town Hall, Leicester	1
Charlestown, Ardes—Sinking Well, &c.	Bernard Halfpenny, Charlestown, Ardes, Ireland	1
Bellevue—Laying Electric Light Cables	James G. Nelson, Clerk, Belfast	1
Halifax—Bridge over the Ford of Mariner	Statenshaabengs Kontor, Reventagsgade 10, Copenhagen	1
Halifax—Waterfalls—Waterworks	Malcolm Paterson, M.I.C.E., 35, Manor-road, Bradford	1
Aldershot—Laying Electric Light Cables and Mains	W. E. Foster, Clerk, Council Offices, Aldershot	1
Manchester—Locomotive Tipping Crane (10-ton)	C. Nickson, Spvt. Gas Dept., Town Hall, Manchester	2
Halifax—Lathes	F. Spencer, M.I.E.E., Tramways Manager, Skircoat-road, Halifax	2
Halifax—Lathes	The Engineer's Department of the Foreign Office, Whitehall, S.W.	2
Felixstowe—Seven Goggles at Hamilton-terrace Cliff	The Surveyor's Office, Town Hall, Felixstowe	2
Stonehaven—Water-Supply Works	J. Graham, County Sanitary Inspector, Stonehaven, Scotland	2
Littlehampton—Furnace Plant	H. E. Towns, Office, Littlehampton	2
Manchester—Washer Scrubber, Rochdale-road	C. Nickson, Spvt. Gas Dept., Town Hall, Manchester	2
Enfield—Well, &c.	Richard Collins, Surveyor, Court House, Enfield	2
Enfield—Well, &c.	S. Thomas, Esq., Bishopsgate-road, London Green, N.E.	2
Stromness—Timber Ferry, &c.	D. A. Stevenson, Engineer, Northern Lighthouse Board, Edinburgh	3
Blackmill—Steel Girder Work for Bridge	H. Dawkin Williams, C.E., Blackmill, Bridgend	3
Blackburn—Waterworks	W. C. W. Hodson, Engineer, Council Offices, Aberdeen	3
Blackburn—Waterworks	Chas. A. Kent, Secretary, Trinity House, E.C.	3
Blackburn—Waterworks	J. L. Devenish-Meares, C.E., Town Hall, Newry	3
Blackburn—Waterworks	S. Barnard, Esq., 1, Strand, London	3
Barnsley—Repairs to Mains	The Surveyor, Council Offices, Rymanway, Yorks	7
Stirling—Waterworks	R. and J. M. Macleach, District Clerks, 22, King-street, Stirling	7
Stirling—Waterworks	J. Earnshaw, M.S.A., Architect, Bridgford	8
London, S.W.—Reconstructing Tramway Routes	The Engineer's Department, County Hall, Spring-gardens, S.W.	8
Newhaven—Penstock, &c.	F. J. Raynor, Town Surveyor, Newhaven	8
Stirling—Waterworks	Schabas Davidson, F.R.I.B.A., 12, Grosvenor Hill, Greenwich, S.E.	10
Weston—Waterworks	Robt. Richardson, C.E., Engineer, Town Hall, Malton	11
East Donnybrook—Dorehole	Sands and Walker, Engineers, Angel-road, Nottingham	12
Apultra—Waterworks	James C. Crompton, Civil Engineer, 11, Lower-street, Whitehaven	12
Colechester—Hot-Water Apparatus at Workhouse	Charles E. White, 37, North-bill, Colechester	13
Fishguard—Extension of Rosslare Pier	J. O'Leary, Engineer, Inchicore, Dublin	14
Rochdale—Laying Cast-Iron Pipes (4 miles, 13in. diam.)	James Manserv, F.R.I.B.A., 3, Victoria-gate, Westminster	15
Blackfastleigh—Waterworks	T. W. Stainthorpe, A.M.I.C.E., Gate House, Totnes, Devon	15
Amalsø—Harbour Improvements	The County Surveyor, Court House, Downpatrick	15
Calcutta—Two Intersectors	Corporation of Guisaford, Secretary, Calcutta	Dec. 31
Sydney, New South Wales—Harbour Bridge	The Agent-General for New South Wales, 9, Victoria-street, S.W.	Feb. 28
St. Petersburg—Two Bridges over the Neva	The Delegation Municipale, St. Petersburg	Sept. 11
St. Petersburg—Two Bridges over the Neva	H. H. Humphreys, Gas Engineer, Salisbury	15
Partick—Hot-Water Meters	H. B. Maxwell, Boro' Elec. Eng., 32, Clyde-street, Partick, N.B.	—

FENCING AND WALLS.

Horseshoe—Cemetery Fencing	Urban District Council	Sept. 30
Hendon, N.W.—Oak Fencing	S. Slater Grimley, Engineer, The Burroughs, Hendon, N.W.	30
Salford—Wrought-Iron Railings, Brown-street	The Borough Engineer's Office, Town Hall, Salford	Oct. 1
Weston-super-Mare—Boundary Walls to School	Hate F. Price, Architect, Weston-super-Mare	2
Salford—Railings, &c. Waste Cemetery	The Borough Engineer's Office, Town Hall, Salford	2
Ashton-in-Makerfield—Wrought-Iron Fencing (500 yards)	John W. Liveredge, Surveyor, Public Offices, Ashton-in-Makerfield	2
Crickgreave—Cemetery Wall	W. D. H. Tugger, C.E., 17, Don-castle-street, Belfast	7
Ilford—Boundary Wall and Fence, &c., Ley-street	H. Shaw, A.M.I.C.E., Surveyor, 7, Cranbrook-road, Ilford	7
Brintree—Boundary Walls, Fencing, &c.	Frank Whitmore, Architect, Chelmsford	15

FURNITURE AND FITTINGS.

South Norwood—Furniture for Schools (1,310 children)	Croydon School Board	Sept. 28
Croydon—Furniture for Schools	The Chief Constable's Office, Croydon	30
Hendon, N.W.—New Public Offices	S. Slater Grimley, Engineer, The Burroughs, Hendon, N.W.	30
Solihull—Seventy Furniture Bedsteads, Bins, Chairs, &c.	Ladbury Thompson, Clerk, Bank Buildings, Solihull	Oct. 1
Leeds—Furniture for Public Houses and Eighty Mattresses	James H. Clark, Foot Lavatory, 10, St. Patrick's, Leeds	1
Bradlington—Furnishing Mixed and Infant Schools	J. Earnshaw, M.S.A., Architect, Bridlington	8

PAINTING.

Bakewell—Workhouse Infirmary	Guardians	Sept. 25
Redruth—Workhouse	Thurston C. Peter, Clerk, Town Hall, Redruth	28
Leeds—City Dispensary	T. Winn and Sons, Architects, 43, Albion-street, Leeds	30
Birkenhead—Workhouse Hospital	F. J. Carter, Union Clerk, 45, Hammer-squre, Birkenhead	30
Preston—Cemetery Chapel and Lodges	Mrs. Vevers and Myers, 15, Chapel-street, Preston	30
Town Workhouse and Infectious Hospital	F. J. Carter, Clerk, 45, Hammer-squre, Birkenhead	30
Barneshead—Church	Myres, Truscott, Clerk, Truro	Oct. 1
Starbuck, Harrogate—Steam Laundry	N. and W. Reid and Witter, Architects, Elgin	1
Bradford—School Board Offices	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	12
Carlisle—Chapels at Cemetery	The Architect, School Board Offices, Manor-road, Bradford	12
Birkenhead—Sixteen Through Houses and Central Stores	W. B. Jack, Architect, 33, Lower-street, Carlisle	12
Leeds—Public Bathing and Forty Houses	W. Outwaite, Secretary, Birkenhead	12
Long Eaton—Two Factories, Cottages, &c.	J. L. Vincent, Borough Surveyor, Town Hall, Newbury	12
Bradford—Salem Chapel	John Sheldon, Architect, Bradford House, Long Eaton	12
	A. Huley, 113, Clifton Heights-lane, Bradford	12

PLUMBING AND GLAZING.

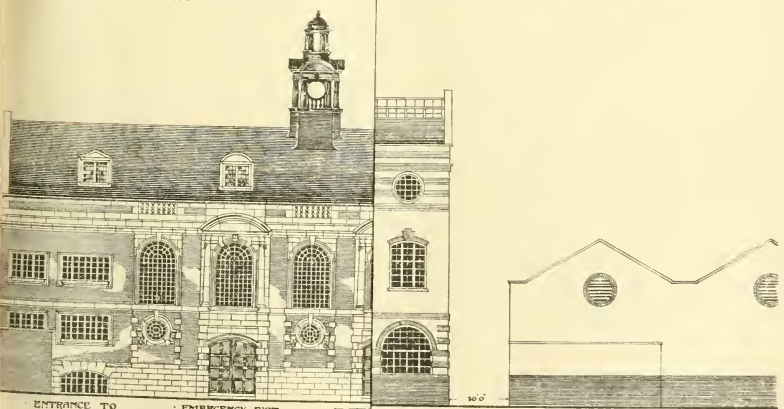
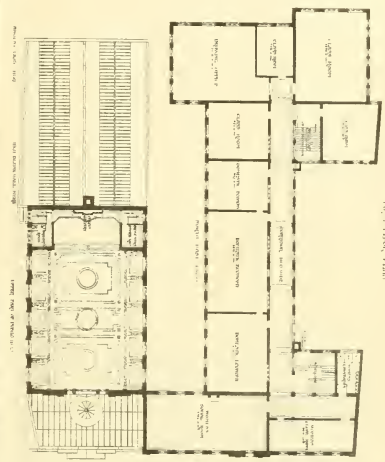
Glasgow—Barnhill Poothouse	Parish Council	Oct. 2
Cockermouth—Water-Main, &c., Flimby Lodge	Health Committee	5
Sheffield—Public Bathing	J. Blackburn	5
Pontefract—Business Premises, Market-place	Tennant and Bagley, Architects, Rispergate Chambers, Pontefract	5

ROADS AND STREETS.

Witham—Stone Paving at Chipping Hill	Urban District Council	Sept. 25
Play—Street Works	R. M. Robson, Surveyor, Council Offices, Eley	30
Beage, S.E.—Private Street Works, Tremaine-road	Herbert W. Longdon, Surveyor, 7, Town Hall, Anerley, S.E.	30
Harrogate—Paving Street	The Borough Engineer, Harrogate	30
Chertson, Folkestone—Widening Risborough-lane	F. W. Ruck, County Surveyor, 86, Week-street, Maidstone	30
Motherwell—Road Works (4,500 yards)	James M. Millan, C.E., Cowgill, Lammington	30

Telegraphic Address:—London Office, "JOHN KNOWLES, LONDON." Works Office, "KNOWLES, WOODVILLE." London Telephone No. 7387.

DESIGN



ENTRANCE TO
PLATFORM .

EMERGENCY EXIT .

EMERGENCY EXIT .

ENTRANCE TO COURTYARD .

ELEVATION TO AIR .



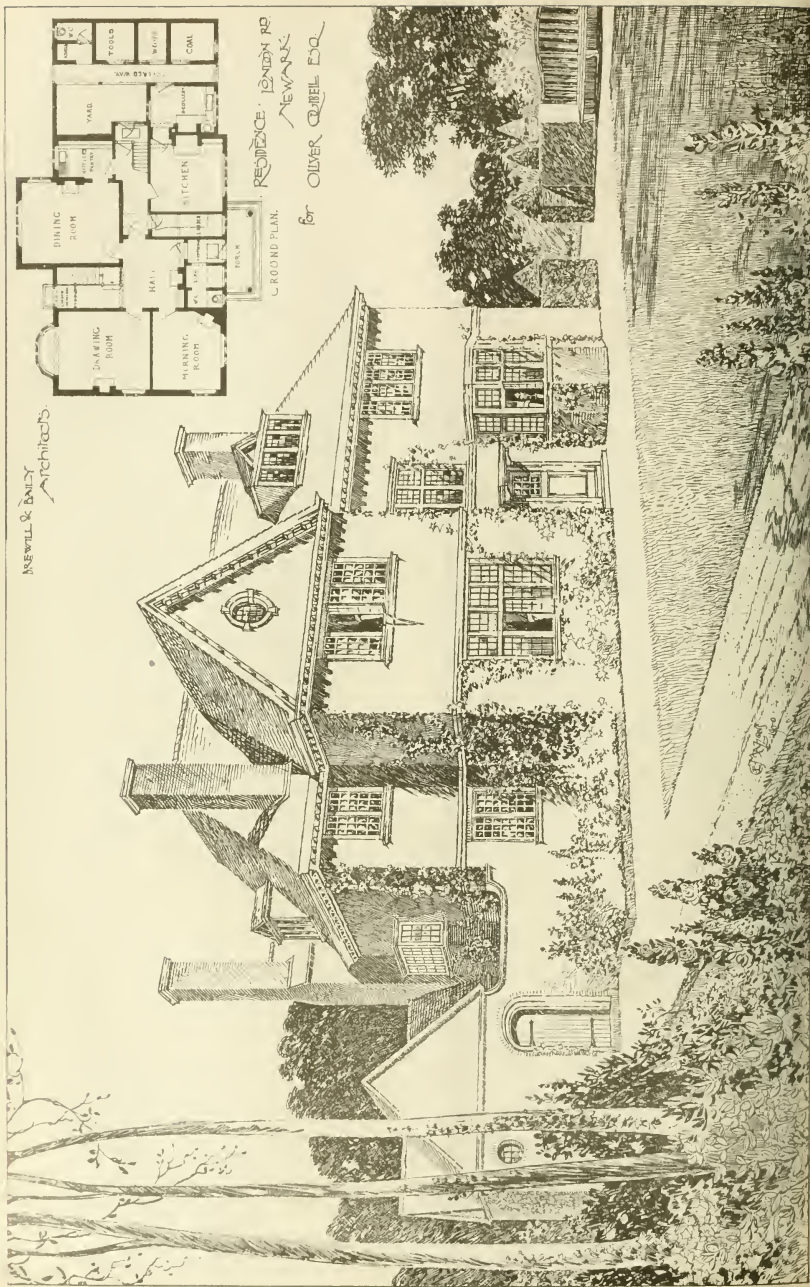


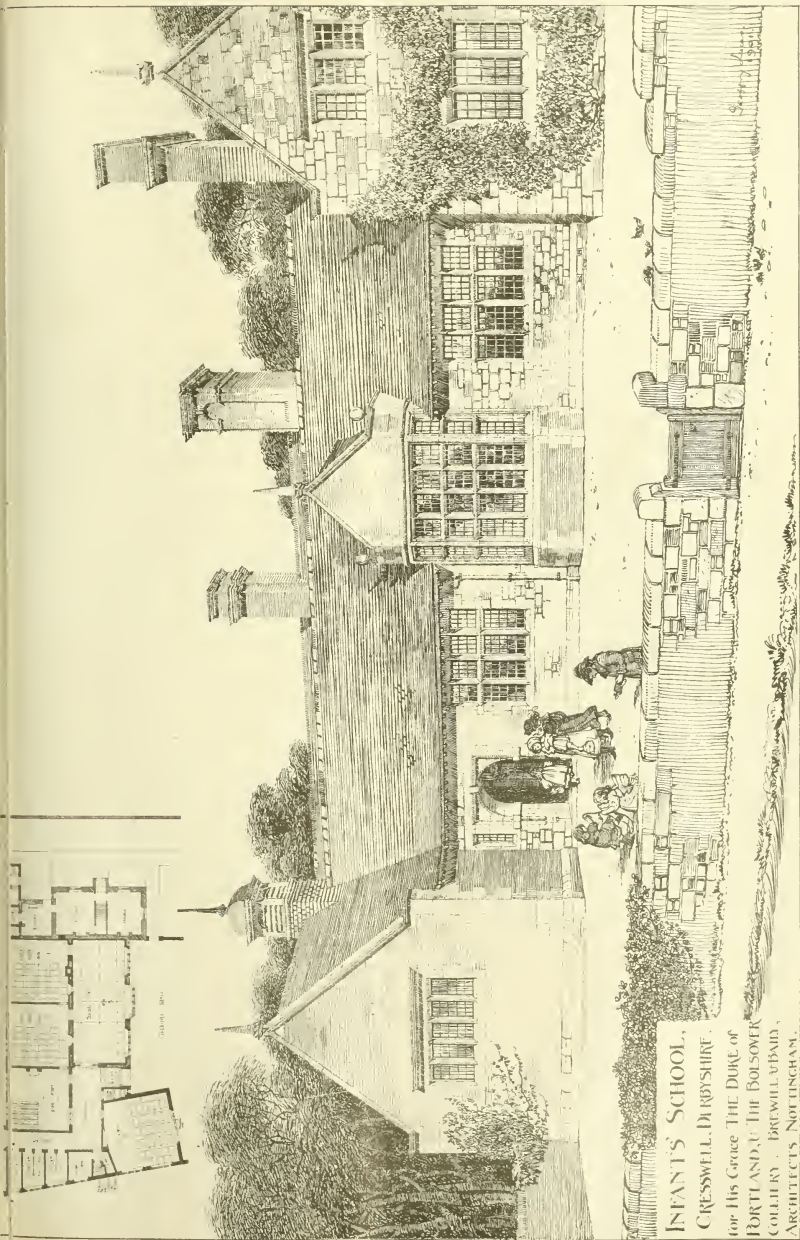
NEWELL & BAILEY
ARCHITECTS



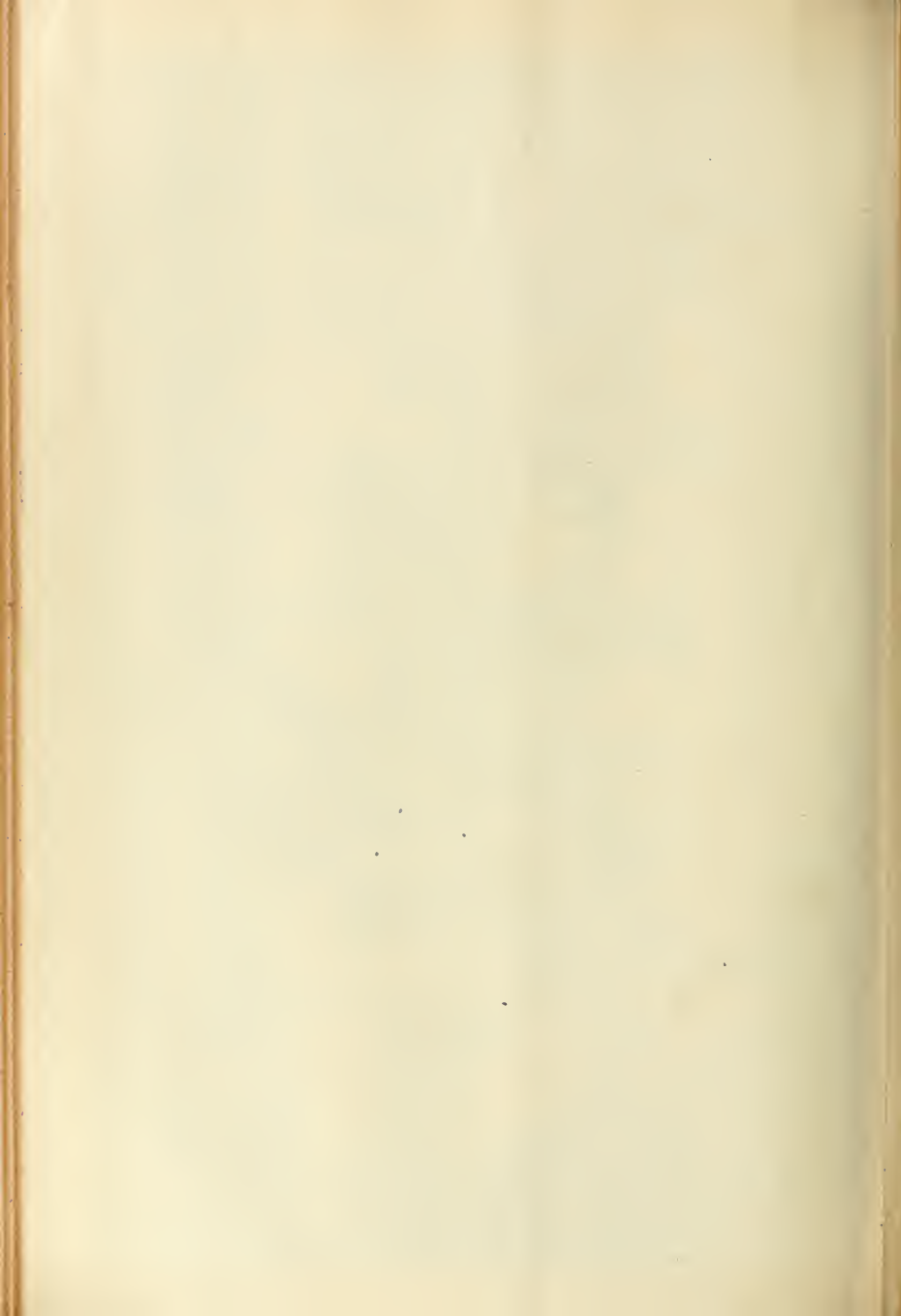
GROUND PLAN

RESIDENCE, LONDON RD
NEWARK
for OLIVER QUELLEN ESQ





INFANTS' SCHOOL,
CRESSWELL, DERBYSHIRE.
 for His Grace THE DUKE of
 PORTLAND & THE BOLSOVER
 COLLIERY. BREWELL & PAID,
 ARCHITECTS, NOTTINGHAM.



THE BUILDING NEWS AND ENGINEERING JOURNAL.

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FRIDAY, OCTOBER 4, 1901.

THE EMPLOYMENT OF ARCHITECTS.

WHAT proportion of our edifices are professionally designed and built, it would be difficult to say. Quite a large number are yearly erected without at least the ostensible aid of an architect. Our street premises bear evidence of this fact. We look in vain for any treatment of the shop-front or the disposition of windows or ornamental features that will attest the architect's skill in those matters; they are often so dull and commonplace, or are of so stereotyped an order of elevation. And yet we have no right to conclude from these appearances that they are destitute of architectural skill. The plan may be skillfully arranged for the site or the business, and however commonplace, there may be good proportion and detail which only a close examination will reveal. Here and there one finds a building of a quiet and unostentatious kind; but the bulk of the work discloses a commercial and vulgar view of architecture, and ignorance of detail. The fact is, many of these street buildings have been reconstructed, the lessee employing a builder to design and carry out the work. Why is this indifference to employ a professional man? Is it because the architect thinks it beneath him to employ his skill in the design of shop premises of this kind, or is it not rather his inability to tackle so prosaic a problem? We rather suspect that the latter is the main reason. The ordinary shop premises call for some skill in the plan and internal fittings, and there are few architects who know much about those arrangements. The expert shop builder or carpenter gets the work. There are many builders or shop fitters who undertake to design fronts, and the architect, because of his lack of experience, is disregarded. In fact the building enterprises in large towns are more than ever under the control of capitalists and syndicates who engage experts, who are only architects perhaps in name, if they even assume that title. There are two sorts of building that are not put into the hands of the profession. Those constructed for special engineering or trade purposes—like breweries, engineering factories, and the like, and those of modest and everyday character. We cannot, of course, expect an architect to know all the trades, or be familiar with the processes of manufacture requiring special machinery and plant to be provided for; but his business is mainly to arrange and shape the technical details of such things as electric-power installations, of laundry appliances, to design suitable receptacles or buildings for them, so that the buildings erected for electric-light stations or public laundries and washhouses should not offend against the laws of good taste and architectural design. But it is unfortunate that the profession that such regard or form and expression in our public buildings is not popular. We can hardly say that it is valued; so that the architect's remuneration is poor chance of requital, and the man who is just provide, however roughly, for the requirements of the trade gets the work, or some trades a mere shed or shanty will suffice, and so it is that the profession loses a great deal of the work they ought to have, there is sometimes an excuse for this. When a tradesman or manufacturer employs an architect to prepare designs for his premises or factory, an acknowledgment is made that architectural claims are valued; it is some shelter that men are not quite satisfied with the shelter and necessities of machinery, but

require an adequate manifestation of art. In not a few instances this desire to display success in business and art triumph has been carried to an extreme, as we see in the palatial structures imitating Gothic and Renaissance that have been erected for the manufacture or sale of ceramics or drapery, in large shops, and in pretentious and luxurious restaurants during the last few years. In many of these it would appear the architect was allowed a *carte blanche*—a free hand to lavish decoration on the building regardless of cost, without any corresponding desire to study internal requirements. The consequence has been a large expenditure of capital disproportionate to the advantages derived, and a disinclination on the part of owners of promises to engage architects. We are not prepared to say whether the architect in any of these cases exceeded his instructions; nevertheless, extravagant architectural display has recoiled upon the profession. A comparison of results will be made. Men who have erected suitable buildings for any particular purpose or trade at a moderate cost point to buildings designed by architects as extravagant or ill-adapted, and a general impression is fostered that professional assistance is unnecessary.

To take another class of building—the average dwelling-houses of small rental—a very insignificant number are designed by architects. We certainly deny the profession have any reason to regard this circumstance as a reproach; they must rather congratulate themselves upon it, for the quality of these erections is most unsatisfactory. They have disgraced many of our most beautiful suburbs. The architect may indeed point to our ordinary suburban houses and villas as a striking object-lesson of his non-employment. And yet the fact is very unsatisfactory on other grounds. These buildings are discreditable to our national art; but what is the reason of the non-employment of the architect? There are, perhaps, these two chief reasons: first, that the design of an ordinary dwelling-house is an easy matter, and that scores of good models can be found; second, that an architect cannot be expected to make any object. We may just examine these arguments briefly. If we regard the design of a house as so many rooms with entrances and windows inclosed by outer walls, then truly anybody may become his own architect. It is an easy matter to look over published plans of houses and adopt that which seems most suited to the ideas of the owner. But if it is, as it ought to be, an adaptation to the environment—an evolution of the habits and social tastes of the occupant, in which every room has been arranged with reference to aspect, to use, to physical comfort and taste, and the exterior has been shaped to the requirements—the design can only be made by an architect. Perhaps the most mechanical type is the house in a row, where there is more or less repetition, due to the same aspect for chief rooms and the same external dimensions. It is, of course, possible that the design may be a copy of a similar house, and that the architect's assistance may be dispensed with. Hundreds of such houses are built every month in London without any professional aid. But even in these circumstances the fact does not justify the means. Because a practice is common it does not follow that it is either wise or expedient. Men live in unsanitary dwellings in thousands in London, and partake of unwholesome diet, but the fact does not show it is right. There are more dwellers in unhealthy houses in London than there are in healthy dwellings. Cheapness or avariciousness is the cause of badly-planned and imperfect houses, and this cause leads us to the second point; and here we think experience has proved that there is no saving in a cheaply-built house. To say nothing of plan or design, the cost of repair is endless, and

often exceeds the small fee of the architect. Bad foundations, cracked walls and plaster, insanitary drainage that has to be overhauled on the first appearance of an infectious scare, leaky roofs and gutters, and bad fittings and workmanship everywhere compel the hapless owner to spend money year after year if he wishes to keep good tenants. As in the case of law or medicine, the man who "becomes his own architect" well deserves the stigma of the old adage. There is another aspect of the case. The builder who contracts to carry out his own plans cannot be expected to do so at the same rate as he would submit a tender upon an architect's set of plans. He adds a percentage for his extra trouble, and does not scruple to use his own discretion in the selection of material and labour, which he has a right to do. Thus the supervision of an independent party to the contract is lost sight of. But the public believe this course saves the fees, and are thus put off their guard. In the other professions, except that of architecture, scientific skill is the stronghold of the professional man. The medical practitioner, as a member of a recognised scientific profession, claims his remuneration for his expertness in a vocation which the public knows nothing about; and the lawyer can claim also an exactness and skill in his practice; both are guided by definite knowledge and experience—guess-work is a negligible quantity; but the architect is largely guided by judgment and taste in questions which many outside the profession believe they are capable of exercising, and hence it is a fact that this profession is not recognised in the same way as the others; nor, as in the case of the engineer, whose skill and services are based on science more or less directly. The conclusion we have to draw is that where there is no science or skill, there is no inducement to engage a professional man. We go to him because he knows something we do not know; it is because of his expertness in a particular branch that the public seek his advice. The professor of an art like architecture is unfortunately in the position of a man who makes no exclusive claim like that of a doctor or scientist on any subject; his art is not "hedged round"; everybody thinks he can build, and a man who can draw or copy any building is thought capable. "It is only a matter of taste," they say, which everybody is supposed to possess. So long as the profession is not registered or certificated, like the medical man and the solicitor, there will be ground for this notion. So long as the mere draughtsman, or house agent, or builder, can supply plans for houses, the architect will be unrecognised and undervalued. The merest pretender can now call himself an architect. Auctioneers, undertakers, builders, and decorators, affix the title to their business-plates and announcements, and we have occasionally published even more degrading circulars from time to time. Such license has damaged the profession in the eyes of the public who are unequalled to discern the good from the bad, or who really do not know what architecture really is in the true sense. The profession themselves have in many points given themselves away, either by undervaluing their services or by excessive charges, by increasing the expenditure of buildings, and by adopting unprofessional methods.

On the other hand, there are circumstances that favour architectural employment. The effect of restrictions on building have no doubt operated in this direction. Building regulations and by-laws, sanitary legislation, and the like have had the effect of bringing people to architects. It is only the professional expert who has any knowledge of the requirements of these regulations, and he is consequently better able to advise his clients and prepare plans than a builder or any untrained person. It is probably the London Building Act has been in this way

a great gain to the profession in the Metropolitan. Owners of buildings of any importance are obliged to obtain advice or plans that are practicable or that will pass the London County Council; so that, in this case stringency of regulation has been an advantage to the profession, and has served them in good stead. Stringent building regulations have compelled building owners to seek professional assistance, and have therefore conferred an indirect benefit on architects. If there was a law in operation that all designs for buildings in towns were to be submitted to a committee of experts in architectural design, or that the façades in certain streets were to be submitted for approval, the employment of the architect would be even more assured. When the public are compelled to obey laws of sanitation and building their distrust of architects will be lessened; when they see the profession insisting upon the qualifications of its own members by various means they will have less confidence in their own resources; and this is a truth that is forcibly brought home to us in every walk of life. The ignorant are always the more presumptive: they imagine they can understand everything till they are proved to be in the wrong; they resent any interference of authority; they repudiate any professional opinion if it clashes with their own; and they will not see that if there is any "deposit of truth" to be found, it must be in the hands of those who practise the particular profession. But there are still people who think architecture is only an art of building according to one's own fancy, that there is nothing more in it than there is in costume-designing or decoration, that it is devoid of any rule or law. The architect must endeavour to appeal to this class of minds, to prove by irrefragable evidence that there are only two ways of building, a right and a wrong way, and that the intermediate steps are very often dearly bought. There are some things that have seriously hindered any such attempt. The public look with amusement and ill-disguised disdain on the conflicts of opinion and taste between professional men—their opposite views, their failures, their ignorance of common sense; but they have not the critical acception to find out their agreements, and that beneath all the seeming rivalries and discord there is still a substratum of solid agreement on matters of the first importance. It is the external signs of unity that are most prized by the unthinking, as in the suppression of all internal strife, the close guardianship of professional interests, letting nothing leak out that may do damage to the fraternity, legal protection, and recognition. This semblance of unity we find in the close professions of law and medicine; but in architecture, painting, sculpture, music, and the like, where the appeal is to the emotions as well as the intellect, we find disagreement. The architect is, above all others, liable to express his views or feelings in a mode, through the media of building, in a decidedly palpable manner. If his art conflicts with any sanitary law, he is at once censured in no mild terms; if his plan yields to some artistic desire for effect, the public instantly give expression to their feelings, and even a draughty room or a defective drain is placed to his charge—things which his brother artists do not share. But there are some matters yet which the architect must master if he desires to insure a public confidence in his profession: he must be more particular about essential points in design, so as not to provoke reprisals; he must study his client's requirements and pocket, and it is, as the president of a Leicestershire society has just said, it is absolutely necessary, if architects are to retain their position as advisers, that they should possess sufficient knowledge and good taste to justify their existence. Even the public are beginning to be better ac-

quainted with architecture than they once were, and demand a higher standard of competence.

PROFESSIONAL CO-OPERATION.

A QUESTION of some interest that applies to building in this country, and still more in America, is the extent to which engineering-construction appliances have changed the relations between the architect and his client. In many structures in which the requirements of iron or steel construction, of heating, ventilating, lighting, lift machinery, motive-power, have to be considered and met, the architect's work has to be modified or overhauled; in fact, in most of the great office buildings and factories in the States, the building work is subordinated to these requirements of the engineer and manufacturer. The structural and architectural elements present a serious problem to the labour necessary in fitting the building with these mechanical equipments. The building, in fact, is designed to protect and form a framework, so to speak, for the plant. Engineering firms and manufacturers prepare plans and working details and specifications for their several works, and these often considerably overlap the architect's duties, and, as a writer in an American engineering journal observes, this combination of structural work and machinery installation has raised important questions as to the division of the design, as well as the amount of fees for the design and supervision of the work. In many business premises and warehouses in the City, iron or steel enters largely into the design, and the question may sometimes be asked whether it is more desirable from an economic point of view to employ an engineer or expert in steel construction, than an architect, in preparing the plans for the building? The question, or course, has only arisen during the last decade or two. Before that no one thought of employing anyone except an architect in making the design of a building. There were few specialists who had studied building as a whole; now there are many who design special buildings for their particular work. Architects live in rather revolutionary times. Many get employed not to evolve architecture, but to make a big concern that will pay a large dividend. It may be something in the shape of a huge theatre or warehouse or restaurant in which machinery forms a large part of the business. But what about the architect's fitness for designing and planning such a building? Would not a theatrical manager or a restaurateur, with the help of an engineer or expert, turn out a better design, at least, as far as arrangement and construction go? Or take a set of baths and washhouses. The engineering equipment and laundry apparatus call for the appointment of an engineer as well as architect. Such is the dilemma which awaits the modern architect in future enterprises. The man who can guarantee a paying concern or introduce the latest machinery or apparatus has the first chance. Of course, a competition inviting architects to send in designs for buildings of this mixed kind ignores the engineering, and in this way it often fails to give a satisfactory result. The promoters get a handsome-looking building, to which the mechanical part has to be fitted at great expense afterwards. A second contract has to be entered into, and then the errors of plan and structure reveal themselves. A great deal has to be altered and pulled about at much cost. Then the employers or the ratepayers find out the egregious mistake of not employing some specialist architect who would have understood the engineering as well as the building business, and so have saved perhaps thousands of pounds to the company or ratepayers. It would have been even more tolerable in such a case to have employed an engineering firm to prepare plans, and then

obtain the services of an architect to put them into pleasing form and proportions. This has been the experience of many.

Let us endeavour to begin by accepting certain principles for buildings of this complex character. In the first place, we cannot ignore the engineering element: it must be accepted, and the more honestly we deal with it, and make it a part of the design, the better. For certain classes of buildings—warehouses, hotels, high-tenement structures, railway stations, public baths, &c., the mechanical construction and mechanical equipment is of the essence. Next we have to consider how we can manage to combine the engineer's with the architect's design in the best manner. Two questions arise. Is it best to employ an architect to design the building outright, and an engineer to arrange the mechanical part and equipment of the structure after the first has been completed, or the other way round, so that they be jointly employed to design the building and fittings, each co-operating with the other in the preparation of plans and specifications before the contract is taken? The architect may, and often does, resent any interference with his design, in which case there is friction between the two factors; but it is more reasonable to acknowledge that the latter mode is less open to failure, than the plan so frequently adopted of finishing the building to the architect's plan and then calling on the engineer to do what may be the principal part of the design. As a result numerous alterations are required by the engineer—walls have to be taken down, or girders and arches introduced, to let parts of the machinery in, or to allow for water and steam pipes—floors have to be removed or "trimmed," and various new foundations made for machinery, boilers, and dynamos. All these things can be avoided if the architect consults the engineer at an early stage, before the plans and sections are inked in, or the specifications drafted. The architect and engineer would in fact be joint architects or engineers of the scheme. At the last annual convention of the American Institute of Architects, held at Washington, a report was read on the question of the overlapping of the professional duties of these professions. The report was drawn up after a conference with the American Society of Heating and Ventilating Engineers, a large and influential body, together with the engineers of various specialities and representative architects. One object of the conference was to amend the Institute's schedule charges, and it was recommended that "the minimum fee of the architect for portions of his work involving electrical, mechanical, and sanitary engineering, heating and ventilation, be made 10 per cent. of the cost of those parts of the work; that the architect select engineering experts, and the latter render their services under the supervision of the architect." We do not think the professions can grumble at this arrangement; no doubt in important work, such engineering as is required may be desirable to place the engineer on a footing with the architect, as in the manner we have hinted, by engaging him jointly with the architect, a course that would commend itself to the engineer. We believe such would be the feeling of the American Society of Civil Engineers and other engineering bodies interested. There is a heavy responsibility on each of the professions, even perhaps greater on the engineer. To take the case of heating and ventilating. Very complex and extensive arrangements are made in buildings of a public kind in the United States, which necessitate very close understanding and co-operation between the architect and engineer. In the large residences, offices, theatres, public halls, churches, and chapels, the architect's plans are considerably controlled by the heating and ventilating engineer. Let us take as a recent instance the arrangements made for these

purposes in the latest of Chicago's office buildings, the Merchants' Loan and Trust Building, a structure of considerable area, and twelve stories in height. This building is warmed by steam distributed through the offices by the downward system of piping, with gravity return. A vacuum system of circulation and automatic regulation for temperature is provided, and a plenum and exhaust system is in use in the lower stories. The steam-boilers are in the basement. Three centrifugal fans had to be provided to blow air into parts of the building densely filled, and two exhaust fans in the basement. Six passenger elevators serve the main floors. The plans for this building could never have been prepared before the heating and ventilating arrangements had been settled by the engineer for the architect, as large exhaust and fresh-air ducts, in some cases 24 in. by 18 in., had to be provided for. Again, the Grand Central Station, New York, shows an extensive building containing a very elaborate mechanical plant, including an equipment of machinery for electric lighting, hydraulic elevators, and air-compressors, which occupy the basement. These plants must have considerably controlled the design, and employed a large number of experts and firms. We have little to compare with these complex arrangements in this country, except in our largest buildings of a similar kind, where the engineer is becoming more and more in evidence. Take any of our large hotels and restaurants, and the provision that has to be made for lifts, heating and ventilation, sanitary and plumber's apparatus. These are features that must receive the closest study, which an architect could not possibly give single-handed.

We have said enough to show the necessity of the co-operation of the engineer with the architect in these undertakings unless serious overlapping and failure are to result. The co-operation should be based on principles that could be settled between the professional men in any particular case. What these should be cannot now be considered; the professional societies might consider the question and draw out a series of rules that could be followed. Such co-operation ought to be defined, and the responsibilities of each member stated, so that disagreement would be obviated. Sometimes the architect would be the responsible individual, but when the mechanical work preponderated or dictated the design, then the engineer would become the authoritative head. The question is a much larger one than can be discussed in one article; there are numerous kinds of co-operation, for each one of which special rules ought to be made, also varying degrees of design in which the engineer or expert, as representing the mechanical element, is concerned. In a few buildings the architectural character assumes a definite or pronounced form; in others the mechanical or engineering element must necessarily claim precedence.

Too much is now left to chance and accident in these matters. The architect supervises a large building—say, a large union workhouse—and separate firms are employed under his general supervision for the several fittings for heating and ventilating and plumbing. They are no doubt highly respectable firms; but with the greatest care and a skillfully-prepared specification, mistakes and omissions will occur, which are too often found out after the occupation of the building. In many other instances of structures on which subcontracting is allowed the great friction and overlapping occur. The question often rests entirely with the architect, and it is to his judgment the appeal should be made. If our buildings are to represent the combined skill of the engineering expert as well as the architect, it is only fair to both that they should be brought into contact at an early stage of the work, and labour harmoniously together in the preparation of the design.

HOW TO ESTIMATE: OR, THE ANALYSIS OF BUILDERS' PRICES.—XXVI.

By JOHN T. REA, F.S.I., Surveyor, War Dept. DOORS.

BEFORE proceeding to analyse the cost of doors it will be well to put down the following labours, which appear rather high:—

	Hours of a Carpenter.
Making doors, deal—	1 1/2 in. 2 in.
Ledged, rough, and edges shot, per ft. super.	" 22 '23
Do, do, if ploughed and tongued	" 47 '51
Do, do, wrought a.s.	" 32 '42
Do, do, braced	" 38 '56
Do, do, if hung in one leaf.	" 14 '16
Square framed, two panels.	" 36 '38
Do, do, ditto four	" 42 '42
Do, do, ditto six	" 48 '48
Do, do, ditto to each face if moulded	" 11 '11
Do, do, ditto if hung folding	" 13 '13
Hanging doors	" 08 '08
Do, folding	" 16 '16
Door linings	" 18 '23
Square, planed, fixed complete, including lockings	3 in. 1 in.
Single rebated ditto	" 28 '30
Double rebated ditto	" 36 '38

A common price for hanging a door is 1s. 6d. in speculating work. The men will hang them (piecework) at 1s. each. A carpenter will hang about six ordinary four-panel doors per day, or one door in 1 1/2 hours, which runs to about 1d. per foot super. In preparing and hanging doors and gates, the time of a labourer should be added

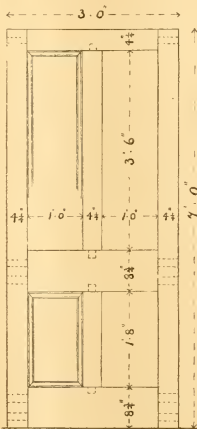


FIG. 12.

for every two carpenters. In all cases the fixing of doors involves and includes the fixing of the hinges.

A joiner will make a 1 1/2 in. framed four-panel door in less than a day, or say 8 hours; a 2 in. framed ledged door in 13 hours, and two ledged trap-doors in a day.

Doors with semicircular heads are worth 50 per cent. more than square; doors with segmental heads are worth 25 per cent. more than square; trap and dwarf doors are worth 25 per cent. more than ordinary; doors prepared for glass are worth 1d. per foot super. more than ordinary.

For finished sizes add 1d. per foot super. to the value of framings. Partitions of spanel shape are worth about 20 per cent. more than rectangular ones.

To arrive at a price per foot super, the cost of a whole door must be worked out in detail, and the result divided by the area in square feet will yield the rate per foot super. Take a 1 1/2 in. deal door, four-panel, square framed, and moulded both sides, and hung, Fig. 12 will clearly indicate the dimensions and construction. As the framing is supposed to be cut out of deals and half-deals, an allowance of 3/4 in. each side has in this case

been made for finished sizes, so that 9 in. and 4 1/2 in. are taken up in the quantities. Panels are 3/4 in. thick, and 1/4 in. extra must be allowed in length and breadth for insertion in the grooves along the inside of the framing. In measuring the latter, the tenons and horns must not be forgotten. The moulding is planted on, and would be machine-made. The door being 7 ft. by 3 ft., contains 21 ft. super., and its price per foot super. would be arrived at in the following fashion:—

Top rail	3. 0
Stile	7. 0
Do, do	0. 0
Muntin	3. 6
Do, do	1. 8
Horns, 4 2 in.	8. 0
22. 10	
4 1/2 s. 7	Top rail, stiles, and muntin.
22. 10	
9. 4	6 Middle and bottom rails.
31. 1	feet super of 1 1/2 in. wrought a.s. deal, s. d.
7. 9	Top panels.
21. 9	
1. 1	3. 10 Bottom ditto.
11. 7	ft. super. of 3/4 in. wrought a.s. deal, s. d.
243. 6	s.o., at 2d.
241. 8	13. 4
281. 0	16. 0
57. 4	ft. run of moulding, a.s., at 1d.
1. 2	Mitre, and fixing moulding, say 1/2 in. run, at 1d.
0. 4	Glass, 1 lb. at 1d.
0. 2	Glass paper, four sheets at 3d.
6. 8	Labour making door, 8 hours joiner at 10d.
1. 4	Labour hanging door, 1 1/2 hours joiner at 10d.
18. 7	
1. 10	Add 10 per cent. profit
21. 20	51
0. 11	Cost per door (21 s. s.)
0. 11	Cost per ft. super.

The labour in making the door thus works out to 4d. per foot super., and 1/4 d. per foot super. for the hanging.

All other framed doors are dealt with in a similar manner, the cost of the hinges and locks being taken in the Ironmonger. For ledged doors take the case below.

2 in. Deal Framed and Braced Door, filled in with ploughed and tongued V-chamfered Matchboarding, and hung.—For convenience of analysis, the same

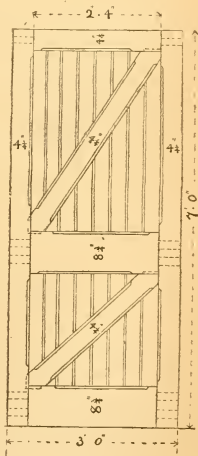


FIG. 13.

sizes have been adhered to as shown in the framed door, and the same allowances made for finished work. The braces and middle and bottom rails are less the thickness of the 2 in. framing by the

some ancient structures. At the same time it is only fair to hazard to remark, woeless in morals, with only of simple deal, and dating, some of them, much earlier than this particular Jarrah example, may be seen, more or less sound, in very many of our own country churches, and in this case also, some of the original boundary posts made of Jarrah wood, 6 in. dia., from the little town of Dunbarry. They were *in situ* 70 years, and, save being a little "gone" at the bottom, are still perfectly sound.

In the Russian section are some fair samples of oak, but nothing anything like such good stuff as was to be seen in the year and a half Antwerp's Exhibition in 1891. The best now at Glasgow appears to be brought from the Mogilev district and the province of Nijni-Novgorod, as well as from the neighbourhood of Volyn. Large pine batts (with the bark on) are shown from Archangel.

It is curious that at a Scotch Exhibition, of all places in the world, there are to be seen hardly any examples of the country's many fine granites. Taken as a whole, the show is largely local, the names over the various exhibits in the Manufactures building being, by a lucky coincidence, those of residents in Scotland. That so excellent and exhaustively complete an exhibition, under these circumstances, should have been possible is highly creditable to the energy of our country friends across the Border.

Glasgow, with a population now reaching close upon a million, stands second in London amongst the cities of the United Kingdom, precisely as Marseilles, with nearly half that number of inhabitants, comes next, in France, to Paris with its two million and a half—Glasgow, like Marseilles, a city I happened to visit less than a couple of months ago, is being largely rebuilt. Whole districts of Glasgow, not only because both are ports of great importance in their respective countries, and in the commerce of the world, but both are practically almost overrun with electric trams. These, in Marseilles and Glasgow alike, seem to be here, there, and everywhere. The Glasgow Corporation property. How many they number I am not aware, but as I rode in one figured 957, there must be at least a thousand. The fares are systematically moderate, and one can have quite a decent ride for a halfpenny. Argyle-street, Glasgow, may be counted as one of the busiest thoroughfares in the world. It reminds one in this respect of Broadway, New York, and is even more like State-street, Chicago. Marseilles has its *Cannibière*, probably the most cosmopolitan street in the whole universe; but that has a character all its own, whilst its position in its own bright and sunny city is much the same that Sackville-street bears to Dublin. But Sackville-street, Dublin, even seen at its best, is cold and empty when compared with the *Cannibière*.

Glasgow, may be, borrowed an idea from the United States when she built her Municipal Buildings in one block, thus getting four fine fronts. The monolith polished granite columns in the main vestibule are splendid specimens of what Scotland can produce in that material, and it is satisfactory to note, the advantage of the dark marble or granite. Ionic capitals they support are all one with the latter. During five or six weeks spent this summer in Italy, it was impossible not to notice that in both old and new work, as a rule, the head does not form part of the capital, but is the actual finish of the shaft. In Italy, the heads of the large columns are generally of richly-coloured marble, the capitals above almost invariably are of white marble. The result is that the white marble capital, set flat upon a coloured marble heading, looks disappointing. Further, by an optical illusion, the diameter of the darker material below seems greater than that of the lighter above—an effect, of course, anything but pleasing.

As this fine edifice has been completed comparatively less than twenty years, it is a matter for grave concern that it should show serious signs of decay. On the John-street side, the facade is now being covered with a network of iron scaffolding for the use of the workmen who are to remedy the defects. Glasgow contractors do not excel in scaffolding. As a rule, very

little is seen in construction; the stones are set "overhand," and instead of relying on builders, inclined planes within the building form the means of ascent for the working staff. Hence it comes about one supposes that the scaffolding now planted outside the Municipal Buildings consists of some quarters of the city surveyors in England would permit to be used. It looks as if it will all blow away the first time the wind blows half a gale. There is an opinion, widely enjoyed by practical men in Glasgow, that the actual stone is not at fault, but that the weakness lies in the mortar, and that much of the work is wrought instead of being cut on banks by hand—that machinery, in point of fact, stuns the surface of the stone it works.

Glasgow is not quite up to the times in some things—for instance, at the main entrance to the Glasgow General Post Office in George-square, I read a notice that smart, active lads are required for the Navy, and another whereupon gallant Scotsmen were called upon to swell the ranks of the Royal Marines; underneath each, in large type, is printed the somewhat out-of-date notice:—

"GOD SAVE THE QUEEN."

The building trade generally seems to be very brisk both within and without Glasgow. Large and important offices are in course of erection in the midst of the city, and one, at least, I saw whose ground floor appears to consist entirely of well moulded and polished granite. Red sandstone is used for the facade exterior, both in the city and in the suburbs. In the course of small houses craning at every hand in the latter, the walls, always thicker than are those of the same class in England, are built of ordinary rubble faced with redstone ashlar.

The grave of Glasgow Cathedral seemed small. If the people who were therein at the time of my visit could have been reduced to half-scale, the surroundings would have looked more proportionate and in keeping with the visitors. One experiences just the opposite feeling at Cologne Cathedral, where the huge statues on each side of the nave dwarf its height, and it is hard to realise that there are 144 ft. between floor and roof. The venerable old building is dedicated to that stern 6th-century North-country St. Kentigern, more commonly known as Mungo, whose usual bed was an old stone coffin, and who, on winter nights, used to write a letter to subside his devotees, and used to say his prayers standing up to his neck in the water-butt! He was one of the earliest of our primitive teachers to erect stone preaching crosses wherever he went upon a crusade. Long after his death these crosses were supposed to possess magical powers, and the crozieres he left to them. Indeed, a very old Glasgow ballad says:

They bring mad men, on foot and horse,
And binden them to Saint Mungo's Cross.

An examination of the various memorials in the graveyard adjacent to the cathedral (many of them ruined in, not only at the sides and ends, but over the top as well, making them look like monster rat-traps) shows the deplorable non-atmospheric-resisting character of most of the stone used. Nearly all face-headed, it comes off in great flakes, the inscription on the very many instances being entirely obliterated.

These notes, hasty and rough as they are, have already grown too long. If, however, they prove useful or interesting to readers, their end is more than attained.

CARPENTERS' AND JOINERS' CO-OPERATION.

A SCHEME is at the present time being A balloted upon by the Amalgamated Society of Carpenters and Joiners, one of the largest and wealthiest trade-unions in the country. It has some 65,000 members have to send in their votes, the whole of October is allowed before the ballot closes. The scheme proposes that the society should start co-operative building and joinery works of its own in various parts of the country, opening new branches wherever the need is thought to be necessary. To enable it to make a start, a preliminary levy of 2s. per member is proposed, producing about £5,000. The executive council would decide where the various co-operative establishments of the society should be established, and it is declared that the first of these shall be at the Milllands. The society's works would be run on strictly business lines, and the profits handed over to enable the business to be extended.

By means of this co-operative movement the

society is hopeful that it will be able to raise the status of its members by establishing a standard wage in all districts where its co-operative works are in operation. It will tender for contracts like any ordinary firm of builders. The greatest benefit to its members is expected to arise from the fact that in case of dispute between them and an employer, with the consequent stoppage of work, the society can come forward and offer to complete the job itself.

A BRIDGE WITHOUT ABUTEMENTS.

PARADOXICAL as the title of our article may at first seem, it is, in fact, a question of some interest to our readers, yet we trust to be able to demonstrate the accuracy and validity of it. It became necessary within the last three years to build three footbridges over the Seine, two of which are more adjuncts or necessities to the bridge of the Invalides and that of the Alma, both of which will be subsequently demolished after the closing of the Exhibition. But the third, which is the subject of our article and of which an elevation is given in Fig. 1, has been erected between the bridges of the Alma and Iéna, and will remain as a permanent structure, and will be of great service to the passengers who have to cross the river in its vicinity, since it unites two of the principal arrondissements of the capital. The large arch, which is its distinguishing characteristic, reminds one a good deal of those of the bridges of Passy and of the Western Railway of France, and harmonises exceedingly well with the existing surroundings. Whatever may be said, and truthfully, too, of the durability and other valuable properties of stone arches, they do not lend themselves with a facility to the construction of light and airy structures equal to that possessed by the metallic material.

This structure which has been, in common with many others, recently erected in Paris for the purpose of facilitating pedestrian traffic in the interests of visitors to the Exhibition, belongs to the type of the trussed arch system which is unknown in this country. The special features attached to the design, although not altogether novel, are such as to entitle them to the notice and consideration of all those actively engaged in constructive engineering. It is intended in our investigation and analysis of the example to set forth the details of the design, the value of the first comprises a general description of the bridge, its principal dimensions, and a reference to some important details which serve to distinguish it from other applications of the parent arch principle. Under the second head, the theory of the structure will be considered, and the value of the particular method employed for modifying or as necessity may arise, for nullifying the action of the thrust of the arch upon the supports. The present bridge is an example of the class known as the trussed crescent shaped arch, which includes several examples upon a very fair scale of magnitude, even in those days of the sixteen and seventeen hundred feet spans of the East River and the Forth bridges. Foremost in length of span among the crescent arches is the one erected in France upon the river of the Seine, the length of the span being 340 ft., the rise of 21 ft. 4 in., and a depth at the crown of 33 ft. A very good second appears in the example at Gramscot, over the North Baltic Canal, which attains to a span of 513 ft., a rise of 7 ft. 4 in., and a depth at the crown of 13 ft. It should be observed that the other two examples in the respective spans amounts to only 33 ft., the other two dimensions in each specimen follow no particular law. The crescent form possesses not only a bold as well as a graceful appearance, but has some practical advantages when headway is an important consideration. Here it is one of the best types for crossing rivers and canals.

The skeleton diagram in Fig. 1 shows the general configuration of the new footbridge over the river of the French capital. It has a central span of 250 ft., and two small spans which are of dimensions too insignificant to be of any use for the purposes of navigation, except for very small river craft. Each measures from the centre of the adjoining pier to the extremity of the semi-arch cantilever, as it is virtually is, nearly 62 ft. It will be seen subsequently that the semi-arches are not so very concerned with the exigencies of the river traffic, but are intended for a very different purpose, and fulfil a duty which is the key to the whole design of the structure. They project over each tank for some distance, which varies with the length of the

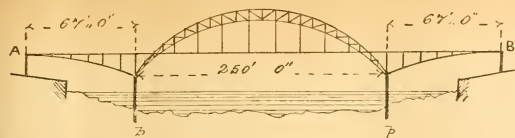


FIG. 1.

main span. The total length of the bridge from A to B in the elevation is 400ft., and the horizontal line from one to the other of these points indicates the level of the platform or thoroughfare. When only one span is required, and consequently the same arched side cantilevers must be carried over the ground, it is obvious that the structure is not an economical one. The two main trusses are placed 26ft. apart, that being the width of the bridge between the inside of the parapets. Each of the principals is continuous at the crown of the arch, but hinged or pivoted at the two supports or piers, p , p' , and this design belongs to the class known as the double-hinged arch, which enjoys a larger amount of favour among engineers than either the triple-hinged or the hingeless examples. The springings of the truss are prolonged considerably below the level of the platform, which lowers the centre of gravity of the whole structure, and materially contributes to its lateral rigidity. This is a quality in which this type of bridge is deficient, as might be inferred from the fact that the arch is in a condition of unstable equilibrium, while its rival, the suspension principle, is the most stable of all bridge designs, and after displacement and temporary deformation invariably returns to its normal position of repose.

Since the whole system in Fig. 1 is in a state of unstable equilibrium, it becomes necessary to anchor down the free ends of the side arched cantilevers, which are riveted up to the framework of the platform. There are three principal reasons for adopting this arrangement. One is, that it is essential to maintain the bearings of the arch over the piers at a constant level, under the action of the uniformly distributed loads and variations of temperature. Further, it is an important requirement that in order to fully develop



FIG. 2.

the advantage of this principle the thrust of the side spans should counterbalance, under favourable circumstances, the thrust of the main central span, which brings us to a consideration of the merits of the whole method. A simple arch, under ordinary conditions exerts a powerful thrust against its abutments and piers, which to resist it must be constructed of commensurate strength and proportions. If by any means this thrust can be reduced, or rendered nugatory, the supports can be built of much smaller dimensions. It may be said, introduce the crown of the springings of the arch across the span, and the thing is done. That is, turn the arch into a bow and string open net girder or tied arch. In the first place, this would be begging the question, and in the second the substitution is quite inadvisable in all the cases, to meet the needs of which the other method has been introduced.

The general system applicable to any form of arch may be represented by the diagram in Fig. 2, in which the central and side spans and their connections with the platform and supports are shown. The total load, which in the present example is assumed to be uniformly distributed over the bridge, is supported as follows: That portion which the left abutment A, that from m to n by the semi-arch A p , that from n to p by the main span, and that from n to B by the other side arch pB . Under the conditions of loading laid down, the central arch will exert equal thrusts at the piers p and p' . Put each of these thrusts equal to T and let H equal the horizontal thrust at the crown of the arch, and θ the angle

which the tangent to the curve at the springing makes with the horizontal; then

$$T = H - \sec \theta.$$

But T may be graphically resolved also at the springings of the arch into its two components, which are the downward pressure and the horizontal thrust against the pier. The former of these is met and resisted by the upward positive reaction of the supports, so that we are only concerned with the latter force, which is counterbalanced as follows:—It will be sufficient to consider one of the semi-arches, A p , and the corresponding half of the main span. The load upon the side is brought directly upon it by the vertical struts in the elevation in Fig. 1, and causes a thrust at the support p , and a tensile stress at the point A, which is taken up by the longitudinal stringer A B, and so disposed up. Let the thrust exerted at the common bearing of the side arch and its adjoining half central be made equal to T_1 , then it is evident that as it acts in the opposite direction to that of the central span it will very materially modify it, and if we call the resultant thrust T_2 , we have—

$$T_2 = (T - T_1).$$

By altering the rise of the arches, different values can be given to T , and may be required for each particular case. If T be made equal to T_1 , the equation becomes—

$$T_2 = (T - T_1) = 0,$$

and in this instance the only forces acting upon the supports are of a vertical nature, and will be resisted by the foundations. This is a well-known arrangement in arch bridges of more than one span, where the ribs are connected together over piers, so that the thrust on one side is balanced and counteracted by that on the other throughout the whole length of the structure, except in the end spans. Here the thrust of the half arch must be taken by the abutments, which must be built of the usual dimensions, and therefore in no way benefits by the continuity of the rest of the bridge. It should be here remarked that when ribs are bolted together over the piers, so that only vertical pressures are brought upon them, they cease to be true arches. The proper and strict definition of an arch is that it is a particular form of construction which exerts a thrust against its supports, tending to overturn them. When this thrust is provided for by the introduction of a tie or chord joining the extremities of the arch, a little apparent difficulty arises. The examples belong then to the type which is the bowstring, and are termed bowstring girders and trusses, although they are real arches. The title of tied arches we have previously used will prevent all confusion, although it must be admitted that the bowstring system acts in precisely the same manner, in some respects, as a simple beam or girder, supported at each end.

It is obvious that so far as the longitudinal tie is concerned, judging from the bowstring girder and the present example, its position may be almost anywhere between the springings and the crown of the arch. It is usually determined by the level at which the road must be fixed. One of the practical advantages of this type of structure, which it shares in common with those of the cantilever system, is that it can be erected by "building out." Thus the footbridge in question was commenced at the same time upon both banks of the river, the execution of the work successfully accomplished without any delay or interference with the navigation beneath. It is in some instances desirable to make the anchoring and holding down arrangements at the approaches to the bridge, and impart a rather more important appearance to the whole structure. This is a common practice with German architects and engineers, who, when their bridges are situated in large towns, are in the habit of erect-

ing handsome towers and portals at their entrances, which removes the somewhat bare look which is presented in our illustration. T. C.

JOTTINGS FROM AN ARCHITECT'S NOTEBOOK.

PLINTHS, string courses, cappings, and other running members worked in stone should be in as long lengths as possible to avoid a multiplicity of joints, which will assuredly take wet in when the pointing fails. Internal and external angles to all such dressings are worked solid, and not mitre jointed. When any horizontal member abuts against a vertical wall, the member should be worked solid on a block which is to be built into and form part of the wall surface. Projecting members in soft stone are sometimes weathered with 5lb. sheet lead in short lengths, dressed closely down on the stone; built at least 2in. into the horizontal joints along the inner edge, and projecting from 1in. to 1½in. over the most prominent corner. In using lead in this manner, it should be left free along one edge and end, for this material expands and contracts very perceptibly under the changes of temperature to which it is exposed in this climate: for the same reason it should be used in as short and narrow pieces as possible. Portland cement is not such an ideal material for pointing the joints of stonework, assuming that the latter does not expand and contract when subjected to extremes of heat and cold. But as it is a well-ascertained fact that stone, like metal, increases in bulk with an increase of temperature, it follows that any material used for stopping a joint in stone will be stretched and compressed alternately, which action will ultimately destroy the jointing material as a watertight seal where it is inelastic. Hence a perfect material for jointing stonework should be possessed of some amount of elasticity—say, like asphaltum. An open joint ½in. wide will take in less water than one 1in. or 1½in. wide, owing to the operation of a force called "capillarity." It is well known that if a piece of sugar is held in contact with water at one extremity, the fluid will rapidly pass into and moisten the whole lump. The same action may be observed by using a piece of ordinary mortar which has been thoroughly dried out, if mixed with cement, ballast, or a piece of oven-dried sandy building brick. Where a stone or brick wall is damp on the inside, the bricks, stones, and mortar joints being perfect, the damp passes through the substance of these materials by capillary action. In a joint or crack where the adjoining surfaces are planes or irregular, and in contact at one or more edges or points, rain water will be taken up and held, or passed on to the inside by pressure from the outside. This peculiar action, due to what is sometimes called molecular attraction, another name apparently for capillarity, is observable in a closely slated roof, where a quantity of water is held after rain between the bed surface of one slate and the backs of these immediately underlying it. An open joint, where the surfaces are nowhere in contact, will be more weather proof than a close broken joint where the fissure is a mere crack. A window sill, for example, where the joint is generally the cause of a wet window back, and a sill damaged in this way should be wholly removed or repaired by cutting away the broken edges, and inserting a new block from 4in. to 6in. wide to the full width and depth of the sill. To attempt any repair of the cracked stonework by pointing with mortar is, in the present case, a pity is worse than useless. In this connection it is a question, when a wall is covered by a deep projecting cornice, whether it would not be advisable to set the stones on a sheet of lead, so that when the joints break, any water passing down the wall, which it would be quite sure to do, would be prevented from entering the wall in this way would perform the same office as a lead seal to a bath or w.c. apparatus; there is a difficulty, however, in the use of lead, especially in connection with lime or cement points, for the mortar may be converted into the carbonate of lime, which case it would be quite useless. A stone gutter lying between the nave and aisle roofs of a sixteenth-century church was hollowed out 16in. wide and 6in. deep, the stones being from 16in. to 18in. long; the hollow was lined with cast sheet lead, which weighed originally about 12lb. to the foot; this lining, when removed, was found to be so rotten that more than half its thickness was converted

into lead carbonate white lead. Whether this was due to the presence of lime in the points of the stonework or to rain-water, which was found between the lead and the stone gatter, it was not easy to determine, but the conversion of the metallic lead into the carbonate was no doubt commenced by pure rain water which in some cases found an entrance to the joints between the lead and stonework. This was not the case with clean metallic lead which, if dipped in rainwater exposed to the air, forms a scale of what is probably lead hydrate, or hydrate and carbonate, a compound similar to ordinary pure commercial white-lead. From the foregoing remarks it will be seen that the use of lead was a protective covering for structures that be advantageous in many cases, but it must be cautiously dealt with, allowing for free contraction and expansion, keeping it from contact with other metals in presence of moisture, and not exposing either surface to stagnant water in bulk, or merely a film which may be constantly evaporated and renewed. In many buildings it is a very common plan to let wrought-iron balusters directly into the ends of stone steps and landings. Where these are under cover oxidation of the iron work does not take place so rapidly as when they are exposed; but all the same, in course of time, from the water used in washing the steps, and hygroscopic moisture, exsolution sets in, and the iron rails burst the ends off the stone steps. It therefore follows that iron stair balusters should not be loaded into stone steps, nor is there any advantage in using the wedge at one end, and an steel girders on the other. A thrust against the balusters and rail does not try the cohesive strength of the stone steps, but is transmitted to the steel string, and both steps and landings are supported in the best possible way to carry the stone weight and the weight of any number of people that may suddenly be brought on them, and this latter is an important consideration in a public building. Solid steps set in masonry have usually a lap of about 1 in. That is, the top of one step underlies the riser of the next which is a "spandrel" step, or undersides exposed are related or supported where the riser of one step rests on the step underlying it. Steps supported on a wall at one end are usually pinned in not less than 10 in. The underside of each step may be horizontal, or splayed to form what is known as a "spandrel" step. In the first case the section of the step is rectangular, in the latter a triangle.

Narrow staircases in church towers are worked circular in plan, a piece of the newel being worked in the end of each step; this newel is usually from 5 in. to 6 in. in diameter, and the whole staircase from 3 ft. to 6 ft. The steps may be rectangular in section or triangular. In such a staircase all the steps are worked to the same mould or template, and they are built in as the walls are raised. There is no ironwork needed in the construction of the tower, the stone being supported in the wall at one end, and on the newel at the other. The steps in each completed circle of a geometrical staircase should rise not less than 5 in., which would give 6 ft. headroom, and allow 5 in. for the thickness of a step.

PENGOVERN COLLEGE, CHELTENHAM.

[WITH PHOTOGRAPHIC ILLUSTRATIONS.]

THIS building has been designed for Mrs. R. W. Pearson, of Cheltenham, to meet the requirements of a private boarding school for girls, in accordance with the wishes of the future private schools of this nature will have to comply with the conditions of the Educational Department regarding suitable school and classrooms in accommodation and sanitary arrangements generally for boarding schools. In a boarding school the two departments consisting of private school and kitchen and school have to be quite distinct, yet united for administrative purposes. The private wing, containing entrance halls, drawing and morning rooms, study, staircase, bedrooms, bath, and, &c., occupy the front of the house, a gateway with the kitchen, scullery, larder, and pantry. The girls' entrance is at the side, with immediate access to the lavatories and w.c.'s, and inner hall for hats, cloaks, lockers, &c., the school, class, and dining-room are entered from

this hall, and a staircase leads to the bedrooms on first floor, and the baths and w.c.'s on the second floor. The school is built in red pressed bricks, with stone dressings, and covered with green slates. The sanitary arrangements have been carried out in the most modern manner, and the buildings lighted throughout by electric light. The contract has been successfully completed out by Messrs. and Sons, of Cheltenham, from the design and under the superintendence of Mr. H. Dighton Pearson, A.R.I.B.A., of Cheltenham, London.

CHIPS.

Boston School Board have decided to erect buildings for a pupil teachers' centre and cookery department at a cost of about £2,000.

The Light Railway Commissioners have submitted to the Board of Trade for confirmation an order made by them for the construction of a light railway in the counties of Kent and Surrey, from Orpington to Tatsfield.

The Board of Trade having confirmed the Provisional Order authorising the construction of a system of tramways in Wakefield, it is expected that the work will soon be begun. It is proposed to extend the scheme so as to serve Rothwell from Loftus, and run into Leeds.

At the Roman Catholic Church of the Sacred Heart in Minchall the new organ recently erected by Messrs. Minns, of Taunton, is just been opened.

An inquiry is to be held on behalf of the Local Government Board into the application of the rural district council for Croxall to borrow £2,500 and £100 for works of sewerage for the parishes of Beedington and Mitcham respectively, also for a new loan required for sewerage works at Coulson.

During the past week the construction of the Bilston-road section of the corporation electric tramways at Wolverhampton has been commenced by Mr. H. Holloway, contractor. The work was started at the Ettingshall-road boundary of the borough, and has been continued as far as Monmore Green. When this section is completed it is intended to install the Lorain underground system of current. The horse trams have been removed, and passengers are conveyed to and from the town by omnibuses which have been provided for the traffic during the making of the new line.

The parish church of London Colney is at present undergoing rearrangement with regard to its seating accommodation. The old-fashioned, narrow, straight-backed pews of the paneled description, which have been in duty for many decades, are being replaced by modern pews executed in pitch-pine. Advantage is also being taken of the opportunity to thoroughly rearrange the seating. The choir stalls are being removed from the gallery at the extreme west end of the church, and are to be provided with stalls in the quasi-chancel, thus rendering the gallery available for the children or other members of the congregation.

Messrs. Mosley and Lovatt, the contractors for the new Exmouth and Budleigh-Salterton railway, are vigorously pushing forward the various sections of the work. Great progress has been made during the last few weeks, and the deep cuttings on either side of the main road at Knowle Hill are giving employment to a large number of men.

The question of providing a new cemetery for the Kirkstall district of Leeds has been further considered by the cemeteries committee of the city council. The committee have decided to purchase from Messrs. Whitaker a portion of the Hawkesworth Wood estate as a site for a cemetery, for the sum of £12,000, subject to the approval of the council and the Local Government Board.

A new theatre is about to be built in St. Giles-street, Norwich. Mr. W. G. R. Sprague, of London, is the architect, and Messrs. Kirk and Randall, of Woolwich, are the builders.

At Crathes, Deeside, N.B., several fragments of an ancient urn and many small fragments of human remains have been found about five feet below the surface of the ground. The fragments of the urn are of very rude construction, and have circular markings which seem to have been made by an impression on a human nail. Several years ago a number of urns were found at Balbriggan, Durra, about one and a quarter miles west of Nether Mills. These were of a more artistic design and finish.

At the last meeting of the board of guardians for Newry, Mr. P. C. Cowan, chief engineering inspector of the Local Government Board for Ireland, attended with reference to the plans for the rebuilding of that portion of the workhouse which was destroyed by fire last year. The plans, with some alterations, were adopted, and it was decided to invite contractors for the execution of the works, the cost of which was estimated at about £1,500.

OBITUARY.

We regret to announce the decease of Mr. JOHN LITTLEWOOD, F.R.I.B.A., member of the well-known firm of Mangnall and Littlewoods, architects, of Manchester. Death took place rather suddenly, as the result of heart failure, on Wednesday last week, at his residence, Lansdown-villas, Old Trafford. The deceased, who was in his 72nd year, was a son of the late Mr. John Littlewood, architect, of Leeds, Yorkshire. He served his articles with Messrs. Travis and Mangnall, architects, of Manchester, and he was engaged with that firm during the erection of many important buildings, including Watt's warehouse in Portland-street, Manchester, the retirement of Mr. Travis he entered into partnership with Mr. William Mangnall. On the death of Mr. Mangnall, in 1874, Mr. John Littlewood joined his brother, Mr. Wm. H. Littlewood, in carrying on the business, retaining the style of Messrs. Mangnall and Littlewoods for that period. Under that title Messrs. Mangnall and Littlewoods have carried out many designs for public buildings, and they have won many premiums and commissions in keen competition. For example, the two brothers obtained the first prize of £500 for their design for the Manchester Corporation Gasworks in Bedford-road. That was so far back as 1878; but, coming to a more recent period, they designed the Campfield Markets, the Salford Corporation baths at Broughton and Regent-road, the new schools and homes for the Chorlton Union Board of Guardians at Withington, and other public institutions. During the last few years Messrs. Mangnall and Littlewoods have carried out many churches and hotels, and have also been conspicuous in the erection of piers and concert pavilions at various health resorts. Morecambe Pier and Concert Pavilion, the Empress Ballroom at Blackpool, are instances of their skill in this direction. Mr. J. Littlewood, whose portrait was given by us in our issue of September 19, 1890, was a member of the Manchester Society of Architects; he joined the Royal Institute of British Architects as an Associate in 1892, he being one of the few architects of the hour who were admitted as usual by the surviving partner, Mr. W. H. Littlewood, under the old style of the firm, Mangnall and Littlewood.

The death is reported of Mr. PETER BALMER, formerly in position as an architect, of the Quarry, Aughton, which took place somewhat suddenly at his residence on Thursday last week. About twelve years ago he retired from practice as an architect in Aughton, where, although then only forty years of age, he had been for many years regarded as the leading man in the profession. Mr. Balmer designed the Emmanuel Wesleyan Chapel, the clock tower, the Aughton-street schools, Ormskirk, the Holt Green Schools, carried out extensions at the workhouse, and did a great deal of work for the late Marquis de Castella. He was but 52 years of age, and leaves a widow and family.

We are also informed of the death of Mr. WILLIAM SWIFT, architect and surveyor, which occurred at his residence, No. 5, the Parade, Truro, on Tuesday week, after three weeks' illness. He was 51 years of age, and leaves a widow, son, and daughter. Mr. Swift came from Birmingham, where he was twenty years ago, being engaged at Tregothnan. He was afterwards with Messrs. Henderson at the Mining Schools, but this engagement terminated about eight years ago, when Mr. Swift opened a practice which he carried on to the time of his death.

The death is also announced of Mr. JOHN MACLEAN, architect, of 14, High-street, Birmingham. Mr. Maclean was elected an Associate of the Institute of British Architects in 1899, and became a Fellow in 1899.

The death is notified of Mr. WILLIAM COLSON, which occurred on Wednesday week at his residence, the Lake, Freemantle, Southampton. Mr. Colson had been for many years in the service of Sir John A. and Sons, the eminent Southampton and its resident engineer at Southampton in superintendence of the important extension works which have been carried out at the Docks—and are still in progress—since the acquisition of the undertaking by the London and South-Western Railway Company. Mr. Colson supervised many other important works undertaken by the firm that he had served so long, including the Royal Albert Docks, at Exeter, and the Alexandra Docks, Hull.

same time in the way of the rearrangement of the font and seats, curtains, gas-lamps outside, and the levelling and planing of the churchyard. This year a contract was entered into for the restoration of the chancel roof and for the removal of paint and colour from the walls. The rafters and main timbers proved to be sorely decayed, and the stonework of windows and arches was found to be so mutilated as to require complete renewal in places. The nave and aisles were also examined and restored, and a like serious state of decay was found to exist in the north and south aisles as in the chancel. The south aisle roof has been made secure by new oak plates and stone coisles in connection with the clerestory wall, and improved in appearance by the restoration of some features. The east end of the north aisle has received similar attention. The wall surfaces have been divested of all extraneous colouring and paint, showing up the beauty of the moulded and ashlar face stonework, and new plastering. The solid oakwork of the chancel roof has been enhanced in appearance by slight gilding and painting. The sham stucco work of the walls has given place to stonework following the lines of the ancient construction of windows, bays, and arches. The floor level of the sanctuary has been lowered, and a better floor has been laid. The builder's work has been carried out by Messrs. Roberts Bros., under the direction of Mr. J. C. Traylen, of Stamford, surveyor for the Diocese of Lincoln.

WOLVERHAMPTON. The new free library, which has been erected on the site of the Theatre Royal at the corner of Garrick-street and Cleveland-road, will be opened in about three months' time. The building will be a great improvement on the old one in Garrick-street. The structure is Renaissance in style, and two stories high. The main rooms will be a news-room and reference library, 55 ft. by 15 ft., and magazine-room and reading library, 50 ft. by 68 ft. The materials used in the exterior walls are mainly red pressed bricks, with terracotta dressings. Over the main entrance, which faces Snow-hill are the Royal arms in terracotta, and over the windows of the Garrick-street elevation are the names of the donors in terracotta lettering. The architect is Mr. Henry T. Hare, of London, whose design was selected in competition, and the builder is Mr. H. Wilcock, of Wolverhampton. The foundation-stone was laid by the Duke of York in July last year.

A bazaar was held last week at Ferns, Co. Wexford, with the view of raising funds for the restoration of the ancient cathedral. The edifice will still be used as a parish church, so that no additional annual expenditure will be required for its maintenance. The first part of the scheme includes the erection of a Groined arch, the repaving of the entire church, opening up the roof, and the erection of altars for the choir and church dignitaries. The work is to be commenced at once. The original view of the promoters was to raise £7,000, but this proved far beyond what was practicable, and the sum now sought to be obtained for the first section of the work, the internal renovation, is £1,100, towards which Earl Fitzwilliam has given £300.

The Local Government Board have written to Hilditch Town Council on the question of the refuse destructor proposed to be erected by the corporation in the valley near North Dean Railway Station. Objection had been raised to it by the board of guardians, who have provided a new workhouse hospital on the hillside above, and also by owners of residential property in the district, on the ground that the fumes from the chimney would create a nuisance. The Local Government Board state that the destructor will only be sanctioned on condition that the chimney be built of brick.

St. Margaret's Church, Ladywood, Birmingham, an unpretentious red-brick building erected a quarter of a century ago, has been reopened after internal decoration in colour. In the interstices between the bays, which are decorated in blue, there is a ground of sky blue painted in, lighted up by golden stars. The side walls are covered with stencillings, and between the windows are four full-sized figures of the evangelists, Sts. Matthew, Mark, Luke, and John. The dirty green and blue tints which formerly covered the walls of the aisles have given place to lighter blue and terracotta tones, with stencilled decorations. Beneath the clerestory windows are the space of the arches, which support them, are painted upon banners—the heads of apostles. On the one moulded at the western face of the chancel arch is a fresco painting of Mary upon clouds, and on the eastern face, and upon the other is a representation of the patron saint of the church, St. Margaret.

Engineering Notes.

HULL. Yesterday (Thursday) Ald. Jarman, chairman of the bridge committee of the Hull Corporation, laid the foundation-stone of the new bridge which is to cross the River Hull at Scott-street. Powers for the construction of this bascule bridge were obtained by the corporation in 1896, and it is expected to be in working order next year. The abutments and approaches are now being proceeded with. The bridge itself will be built of iron and steel. Crossing the river midway between North Bridge and Sealcotes Bridge, it is situate between Scott-street, Waincole, on the west side, and Lincolne-street, Waincole, on the east side, and N. Mark-street on the east. It will bring the east district in more direct communication with the Cannon-street Station of the Hull and Barnsley Railway, the north-west part of the city, and the numerous timber-yards, oil, flour, and paint mills, and works situate on the river banks. The cost of the bridge, including the property required for the approaches, will be about £30,000. In connection with it is a subway for water, gas, and electric mains. The corporation have also obtained power by their Act of 1901 to construct a bridge over the river, which will bring the number of bridges across the river up to six, five of which will be under municipal control. Until some 30 or 35 years ago there was only one, the North Bridge. This was originally a permanent arch, then a bascule, and afterwards telecopic.

CHIPS.

Plans have been prepared, and are on view in Buxton Pavilion, for an open-air house to be erected next year, from designs by Mr. Frank Matcham, of London, in the Buxton Gardens. Accommodation will be provided for 1,130 people. A new main entrance to the gardens, part of the scheme, to be in harmony with the architecture of the new open-air house, the exterior of which will be stone.

The Corporation of Glasgow have accepted from Sir Donald Currie, for the Art Gallery, a large painting of "Niagara Rapids," by Mr. Colin Hunter, of Glasgow.

The rebuilding of the old barracks at Maidstone is being carried out. All the wooden structures are to be pulled down, a few at the time, and replaced by modern buildings, which will be built with a view of facilitating the equipment of troops. The work will be as yet unstarted, according to present arrangements, in the permanent military forces at the barracks.

Reopening services, after the decoration of St. John's Church, Longton, Staffs, took place last week. The work has been carried out by Messrs. Battison and Bridgett, on a specification and drawings made by Mr. J. H. Beckett.

The urban district council for Wellington, Salop, have under consideration in committee plans for water supply and sewerage prepared by Mr. R. E. W. Berrington, A.M.I.C.E., of Wolverhampton. The estimated cost of the proposed reservoir, to hold 8½ million gallons of water, is £11,250.

The Fulham Borough Council have acquired from Miss Sullivan, as a recreation ground for Sand's End district, the estate known as Southfields, which has an extent of nearly 22 acres. The price to be paid for the new park, which is near Hurlingham, is £32,784, and the expense of laying out and fencing will raise the total cost to £15,000.

The Mayor of St. Ives, Hunts, has issued an appeal for funds to complete the statue of Oliver Cromwell, which is about to be unveiled in the town at a cost of £14,000. The foundations consist of five blocks, in which there are a slaughter-hall 115 ft. by 135 ft., cooling-room 115 ft. by 155 ft., cold stores with 100 ft. of ice space, a large freezing-room, engine-room, and store and larder accommodation.

The new public slaughter-houses and chillrooms at Barrow, which have been erected by the corporation at a cost of £14,000, were formally opened on Monday by the Mayor. The buildings consist of five blocks, in which there are a slaughter-hall 115 ft. by 135 ft., cooling-room 115 ft. by 155 ft., cold stores with 100 ft. of ice space, a large freezing-room, engine-room, and store and larder accommodation.

The North British Railway Company proposes to erect a new station which will eliminate much that remains of the once-famous Castle of Berwick, which was purchased by the North British Railway Company for the erection of the present station in 1845.

PROFESSIONAL AND TRADE SOCIETIES.

NATIONAL ASSOCIATION OF HOUSE DECORATORS.

—The eighth annual Convention of the National Association of House Painters and Decorators was opened at Leicester on Tuesday. There was a large attendance of members from all parts of the country, who were presided over by Mr. J. W. Barker, of Leicester. The Mayor of Leicester (Mr. Alderman Windley) welcomed the Association to the town. Mr. T. W. Lallo, president of the Master Painters' Association of Scotland, and Mr. John Sibthorp, vice-president of the Association of Master Painters in Ireland, expressed their congratulations on the excellent work which had been accomplished. Sir J. F. L. Rolleston, M.P., then formally opened an exhibition of decorative art and the work done by apprentices, members of the Association in competition for the awards offered. Sir John Rolleston congratulated the Association upon the excellence of the Exhibition, and also on the work done by the apprentices. One of the most notable features in the progress of the industry in this country was the great improvement in the art of house decoration, which was not only observable in the mansions of the rich, but in the homes of the people, and in the places of amusement to which they resorted. All round there was a great advance in taste and in the work done by the apprentices, due to the skill and brains of the members of their Association. Mr. J. W. Barker, the President of the Association, spoke of the efforts of their organisation to promote a love of their work or art on the part of their workmen and apprentices, efforts which had been successful in many instances. The annual report pointed out that the Association had become an incorporated body, and during the year the membership had been increased by 60, while three branch Associations had been established at Loughborough, Macclesfield, and Halifax. One of the most remarkable phases of the work of the Association was that in the training and educational departments. The Association had faced and met its responsibilities to the youths committed to its care, and the success of this work had more than any other gained for the Association the public esteem and respect. In evening the President of the Association and Mrs. Barker held a reception in the King's Hall at the Grand Hotel. At Wednesday's meeting, held under the presidency of Mr. J. W. Barker, Mr. H. Look, of Hull, read a paper on "What to Teach our Apprentices," and Mr. J. W. Barker, of Leicester, read a paper on "The Importance of Handwork instead of Manufactured Ornament." He urged the importance of drawing combined with technical and chemical knowledge. Mr. Walter Crane, R.I., read a paper on "Some Thoughts on House Decorations." He held that decorators might be regarded as a sort of artistic compensation for the increased artificiality, complexity, and restraint of civilised life. The practice of living in flats and residential hotels involved a contraction of space and light that could not have a favourable physical effect, or foster a healthy sense of decoration. The necessity for a collective dwellings might afford fine scope for art. He was glad that a determined effort was being made to return to simplicity in house-designing, furniture, and decorations. Mr. Fletcher, head master of the Leicester School of Art, afterwards read a paper on "The Value of Design and Retention in Decoration."

Mr. H. P. Boulton, an inspector of the Local Government Board, has held an inquiry at Morland into the application of the West Ward Rural District Council for sanction to borrow £2,500 for works of water supply for the village of Nerry, Somerset. Mr. Boulton has recommended that the works should be carried out by the Nerry Sanitary District Council, and that the Council should be authorised to borrow the sum of £2,500 for the purpose.

Glenborohale Castle, Ardaraun, Antrim, which the Highland Museum of the South African financier, Mr. C. D. Ruld, which has occupied more than three years in building, has just been taken possession of by the proprietor. The building, which is costing some £14,000, is in course of erection for Mr. Ruld at Shillbidge.

During the summer recess many improvements and alterations have been carried out in Steiny Hall. The auditorium, which has been enlarged, is now in a new and improved state, affording an uninterrupted view of the platform. The platform itself has been lowered in. The building has been partly reconstructed, and the interior has been redecorated by the artist, Mr. J. W. Barker.

An improved system of heating the hall and passages and ventilating same has also been installed.

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ILLUSTRATIONS.

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Our Illustrations.

ROOTH'S AND CO. (LTD), PREMISES.

The drawing published, from this year's Royal Academy Exhibition, shows the offices of Messrs. Rooth and Co. (Ltd.), in Cow Cross-street, E.C. In the rear their distillery has been entirely rebuilt, with considerable warehouse accommodation. The lower part of the front building is faced with grey unpolished Dartmoor granite, supplied by Messrs. Freeman. Above that Lawrence's red bricks are used, with Monks Park Bath stone. The carved frieze beneath main cornice is executed in Portland stone by Mr. W. H. Pomeroy, the subjects being connected with distilling and wine-making. The slates are green Westmoreland. The contractors for the whole of the work are Messrs. Kilby and Gayford. The electric lifts are by Messrs. Waygood and Co. The casements and lead glazing are by Messrs. Hope and Co. The clerk of works is Mr. J. Brady, and the general foreman is Mr. J. Sturges. The architect is Mr. Edward W. Mountford.

ST. CUTHBERT'S CHURCH, MIDDLEBROUGH.

The new church of St. Cuthbert, Newport-road, Middlebrough, is designed in a simple version of 14th-century Gothic. It is faced externally with local stone, and the main roof covered with red tiles, and those of the eastern chapel and vestries with stone slate. The church is placed close up to the boundary-line of the site on the north side and east end. The eastern front, which is the most conspicuous part of the building, facing the angle of Newport-road and that of the main road, is flanked on the north and south by square towers, the northern one being surmounted by a wooden spire covered with Westmoreland slate. There is a lofty east window with rich tracery, which rises above the vestries and chapel, and the whole front forms an effective and striking composition. There are two doorways on each side of the nave, with porches. The interior walls are of brick, plastered, and the internal ceiling is of wood in the form of a groined vault. There is no structural division between the nave and chancel, the length of the main building being divided into five bays by lofty and massive pillars separating the central aisle from the side passages. The baptistry is at the west end, divided from the nave by three lofty arches, above which is a large circular window filled with stained glass. The processional path is carried round the east end and behind the altar and between the altar and the chapel and vestries. There are three arches at the east end which open into the chapel and vestries, the central arch being occupied by the reredos of the high altar. The choir is surrounded by a low oak screen, and the sanctuary is inclosed on the north and south sides by a stone wall. There is an ascent of seven steps from the nave up to the high altar, which is of

considerable size, and surmounted by a canopy decorated in colour and gilding. The pulpit is of oak, with a canopy handsomely carved and decorated with gilding and colour. The organ is placed on the south side of the church. There is a large plain font of Dunhouse stone and a wooden panelled door round the whole of the church. The side windows, which are placed at a considerable height from the floor, are of two lights, divided by massive mullions. The apsidal chapel is lighted by five two-light windows, with rich tracery, and its ceiling is of a simple barrel form. The interior, though exceedingly simple, is of fine proportion, and though it is still incomplete with regard to its fittings and decorations, the whole effect is very stately and dignified. The church will cost, including the altar, about £10,000. The church has been about £9,000. Messrs. Allison Bros., of Middlesbrough, are the contractors, and the church has been built from the design of Mr. Temple Moore, of Hampstead, London. Our illustration shows the view exhibited at the Royal Academy last summer.

PAINTING OVER THE RERODS IN THE CHURCH OF THE DOMINICAN MONASTERY AT HAWKESHEAD.

This painting is executed in spirit colour and wax, the mull and all parts gilded being raised in gesso. The church is of collegiate form, without transepts, the east end being filled in by a reredos and the painting illustrating the colour above is carried down into the stonework with a full treatment in the centre panels and lighter treatment in the wings. The altar stands in front of the reredos, and is in mosaics. The colour is kept as much as possible in the primaries, the yellow being represented by gold, red by cinnabar, and the blue by ultramarine. The colour of the grounds being specially prepared, and the colour washed on without any admixture of white. The church is carried out from the designs of Mr. Goldie, and the painting and colour treatment is by Mr. H. C. Brewer.

THE CHURCH OF ST. MARY THE VIRGIN, OXFORD.

St. Mary's has played a very large part in the academic history of Oxford, the history of the church during the Middle Ages being practically that of Oxford itself; scarcely any movement towards the development of university life took place which did not originate within its walls, and the church of Westminster, no church within the realm possesses associations comparable to those attaching to St. Mary's. Architecturally the church is not unworthy of its history, and, in spite of frequent repairs and renovations, it still retains much of the charm of antiquity and the beautiful Medieval design. The present church is the third of which we have any record that has occupied the site. There was the Saxon church alluded to in the "Domesday Survey." There was the church as it was rebuilt in the 12th or 13th century, to which was afterwards added the tower; while the present church, dating from the reign of Henry VIII., was rebuilt in the last phase of our native Gothic art; but it is really with the tower and spire added at the end of the 13th century that the proper architectural history of St. Mary's begins. No records tell the story of that stately steeple; but to an architect the stones speak more clearly than any documents, and the stonework remains to indicate the date clearly. As it falls at the meeting point of two styles, the lower part of the tower, solid and severe, belongs to the Geometrical period of Decorated Gothic, when the tracery bar was struck in circular curves, forming pinnacles and towers, which meet and cross tangentially without running together, and similar in character, to the Angel Choir at Lincoln; but as the tower rises its severity becomes softened, and amidst glorious pinnacles and statues, full of that individual distinctive character that well suits the unique historical position which the church holds, rise the lofty windows of that simple interlacing form which belongs to the last phase of its style, while in the pinnacles and niches grouped round the base of the spire, the points of the arches and the trofils in the gables begin to curve into delicate ogee, very slightly expressed, but enough to mark the transition from Geometrical to Flowing Decorated. From amongst this crowd of subordinate members springs the simple octagonal spire with no entasis, but relieved by a projecting circular roll at each angle, finishing at the apex, with a rich crocketed finial supporting the vane, the total height of which, from the church

floor level, is 177ft. This great steeple, unrivalled in its way, was probably not in the design of the 12th or 13th century church, as it is not definitely attached to the church-buildings, and was added after the church of that period had been built without any provision for a tower having been made. Yet its admirable position and beautiful surroundings make it, as it has always been the "eye" of Oxford.

J. FORBES SMITH.

PENGWEN COLLEGE, CHELTENHAM.

(For description see page 448.)

ENTRANCE PORCH, BEAUPRE, GLAMORGANSHIRE.

BEAUPRE MAJOR HOUSE, or castle, as it is locally called—is situated about twelve miles from Cardiff, in beautiful country fully justifying its name. It has been a fine old fortified house, with the principal rooms grouped round a courtyard, which has an entrance gateway, flanked on either side by guard-rooms. It was originally the seat of the Cecil family (then spell Cewilth, the ancestors of Lord Salisbury), who built the greater portion of it. It has, however, been for many centuries in the possession of the Bassetts, and the beautiful Renaissance porch was built, as the inscription states, by—

Rycharde Basset, being to wyf,
Katherine, daughter of John, Knight,
Bewilt this porch and the towers, and 1609,
His years 63, his wyf 55.

There is an interesting story told locally of a tragedy in connection with the building of this porch. Two brothers, both masons of the village of Cowbridge two miles away, fell in love with the same maiden. She married one of them, and the other left the place and made his way to Italy, where for many years he worked as his trade in various towns, becoming very expert. Returning to his native place in the course of time, and resuming his business there in conjunction with his brother, he soon gained a reputation as an excellent and skilful workman, and was commissioned by "Rycharde Basset" to design and build the entrance-porch of Beaupre. This he did, and the beauty of the work brought many to admire it, and filled his brother with jealousy at his fame, until one day, when the building was scarcely completed, the citizens rose and while he and his brother were on a scaffold at the top his envious brother pushed him off, the fall causing his death. The survivor was tried for murder at the Cowbridge Assizes, and, owing to the lack of absolute proof, was acquitted, though popular opinion held him guilty. The majority of the building dates from the latter part of the 16th century. A portion of the buildings, consisting of some half-dozen rooms, is in the occupation of a farmer, and the porch is in fairly good preservation, and well cared for; but the remainder of the buildings is in a ruinous state, and has been left to the mercy of the weather for many years. The roofs are almost all gone, and little more than the ivy-grown walls are standing. R. R. MORTON.

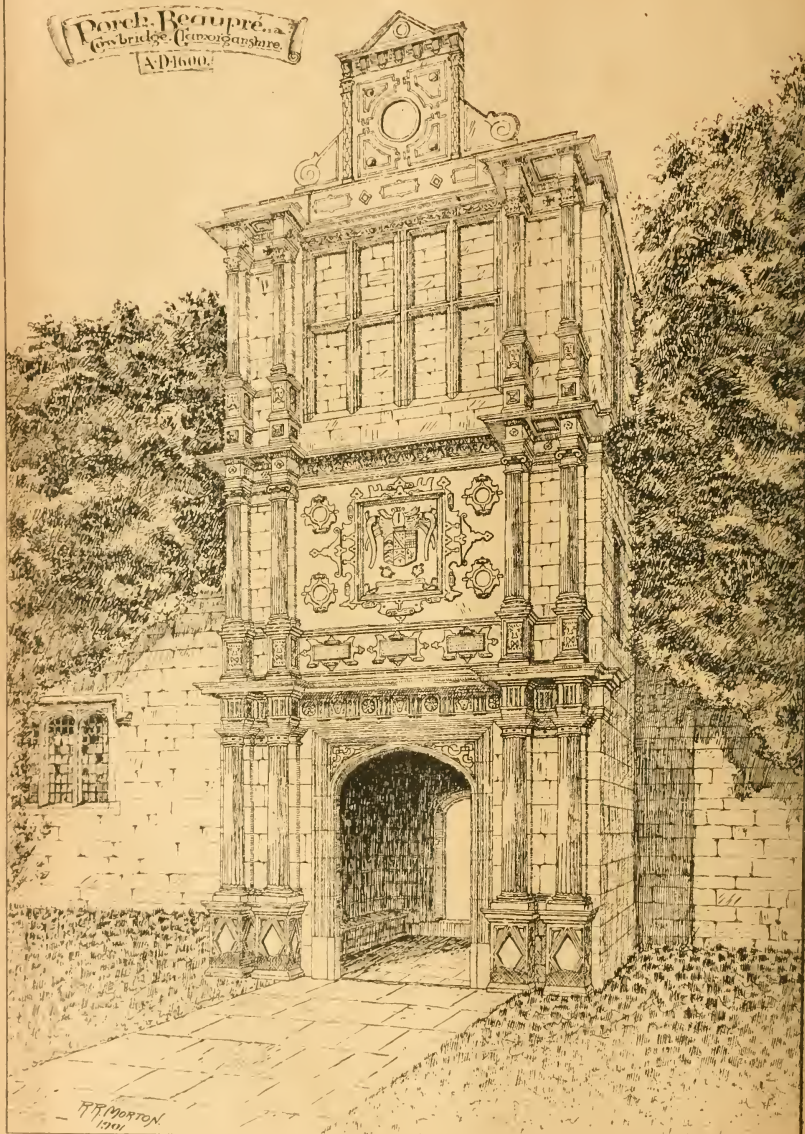
"L'ART NOUVEAU" FURNITURE.

The perfection of cabinet ivory is illustrated by the accompanying specimens of modern French furniture now in the Victoria and Albert Museum, South Kensington. This "L'Art Nouveau" furniture was brought as a collection from the Paris Exposition. The Chair is by A. Darras, and the Commode was executed by Emile Gallé. The top of this piece is shown by a plan. The previous drawings from the same collection will be found in the BUILDING NEWS for Sept. 13 and 27 last.

The city council of Exeter have purchased No. 7, Southemby Street, for £4,000, to serve as offices for the city surveyor.

The latest British Consular report from Siam gives an account of the present condition of railway development in that country. The Northern line, which was the first of the State railways undertaken by Siam, was completed. The line, which will eventually connect Bangkok with Chiang-mai, in Northern Siam, is completed as far as Lopburi, about 80 miles from Bangkok, and is being continued beyond that place. Meanwhile, the development of Bangkok itself during the last two or three years proceeds at a rapid rate. The roads are made, blocks of unsightly or inconcommodious structures have been pulled down and replaced by neat shops and residences; iron bridges have been erected over the various canals and creeks; and electric light and electric tramways have been introduced.

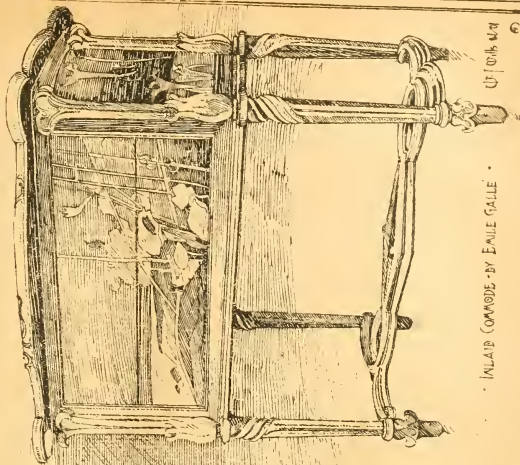
Porch Recouvre
Cambridge, Cambridgeshire
A.D. 1600.



L'ART NOUVEAU FURNITURE
IN THE VICTORIA AND ALBERT MUSEUM
FROM THE LATE PARIS EXPOSITION

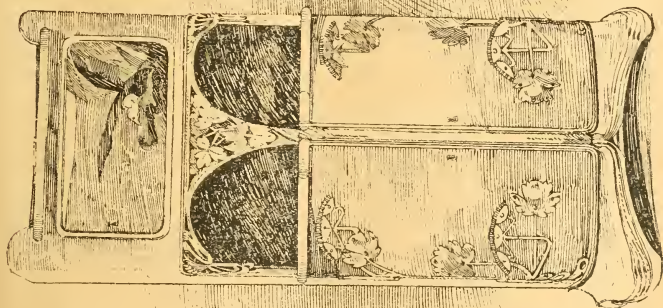


TOP OF
CONSOLE

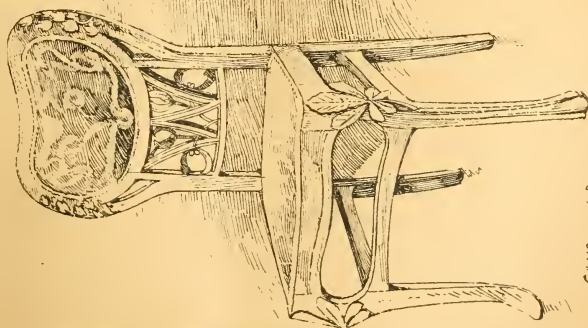


INLAID CONSOLE - BY EMILE GALLE

OF THE ART
6



CARVED AND INLAID CABINET



CHAIR BY A DARRAS

Our Office Table.

The members of the Royal Institute of British Architects are at present visiting Glasgow and its Exhibition. The annual dinner of the Institute was held last Thursday evening at the Windsor Hotel, Glasgow, the President, Mr. W. Emerson, in the chair. To-day (Friday) the Glasgow Institute will entertain the visitors to luncheon at the Grosvenor Restaurant, Exhibition Buildings, at one o'clock. From 2 to 3 and three to five a visit will be paid to the University, on the invitation of Principal Stirling and the Senate; and at half-past seven the Lord Provost and Corporation held a reception in honour of the visitors at the City Chambers.

At the last meeting of the Westminster City Council a discussion took place as to the recent contracts for paving certain thoroughfares in Westminster, notably Whitehall and Parliament-street, with American red gum blocks. It arose on a notice of motion by Mr. Alderman Walter Emden to invite the council of each Metropolitan borough, the Common Council of the City of London, and the London County Council, to appoint one or two of their members and their engineer or surveyor to attend a conference, to be held at the Westminster Town Hall, "for the purpose of considering the best materials and means of paving the streets of London." Mr. Emden said that unless the council decided whether or not to propose that day to proceed with the notice of motion, which he had put on the paper merely to bring the matter forward, and to enable him, if it was the desire of the council that he should do so, to make a statement with regard to the paving works. Mr. Saunders asked whether pending the special meeting, the works that were under contract and were being executed by various contractors would be proceeded with with the same extraordinary expedition that Mr. Allcott had shown. The chairman replied that the town clerk, in accordance with instructions, had attached the seal of the council to all the wood-paving companies' contracts, and unless there was any deviation from their terms, he apprehended that the contractors were in possession of the field. Eventually it was resolved to adjourn the consideration of the motion.

The third annual session of the London County Council Shoreditch Technical Institute, Filders-street, E., under the management of the Technical Education Board, began on Monday evening. The special feature of the work is the practical instruction given in the cabinet-making, wood-working, and building trades. There are practical classes for cabinet-makers, carvers, carpenters and joiners, upholsterers, plumbers, electrical fitters and instrument makers, electrical wiremen, plasterers, and polishers, as well as classes for the study of the scientific principles which underlie the various trades and the practical drawing and mensuration taught in the workshop every day. A new departure has been made by the Technical Education Board in the establishment of a technical day-school for boys who intend to become cabinet-makers, carpenters, joiners, shopfitters, pattern-makers, turners, carvers, or draughtsmen. The boys undergo thorough training in the study of the rules, workshop drawing, arithmetic, and mensuration, and in the usual English subjects. Particulars may be obtained from the secretary at the institute.

At the Oxford Diocesan Conference last week, it was unanimously resolved, on the motion of the Bishop of Oxford, "That more equitable and consistent mode of providing for the repairs of glebe buildings than is secured by the present law of dilapidations is demanded in the interests alike of incumbents and of the Church at large."

The subject of ecclesiastical dilapidations has also been the topic of discussion at the Carlisle Diocesan Conference, where Mr. A. N. Bowman, of Carlisle, read a paper on Mr. De Bock Porter's proposed scheme for insuring against ecclesiastical dilapidations. Very heavy burdens, Mr. Bowman pointed out, were sometimes cast upon incumbents where the cost of the repairs of progressive decay had to be paid for out of the annual stipend instead of being spread over a number of years. A new Act sought to effect a remedy, but even this failed to give the benefits it sought to confer. An incumbent had sometimes to pay for repairs that should have been carried out by his predecessor. The law was unjust to the benefice, and put the interests of incumbents

and beneficiaries in direct antagonism. Under Mr. De Bock Porter's scheme hardships would be avoided; it would also include the principle of insurance. Incumbents would still remain the owners of the property, but would be relieved of the responsibility of keeping it in repair. A long discussion followed, in the course of which the Rev. Canon Campbell, of Workington, proposed: "That this conference approves the principles of insurance and of a compulsory periodical survey for dilapidations, and would welcome the measure suggested by the secretary of the Ecclesiastical Commissioners of the Church of England, as amended by Canon Rawnsley, Keawick, seconded by Canon Hazell, to the effect that no opinion be expressed upon Mr. Porter's suggested scheme until its details had been discussed. This amendment was eventually withdrawn, and the first part of the resolution was adopted, with one or two dissentients."

As the outcome of the deputation of clergy and laymen who a few weeks ago waited on the Lord Mayor of Birmingham on the question of the housing of the poor of Birmingham, a sanitary aid committee was formed in that city. The object of this body is to co-operate with the health committee of the corporation in the improvement of the slum areas. At the inaugural meeting on Friday the Bishop of Worcester said the committee desired to aid the authorities in the arduous task they had before them. The condition of the slums had not been exaggerated. When they had paralled out the city, a certain number of the committee would be appointed to take charge of the houses and report upon them. These members would be responsible for a thorough examination of the district. They would ascertain the condition of the dwellers in the slums, and tabulate their returns in order that a full report might be prepared for presentation to the municipal authorities. Mr. Luke Sharp was appointed treasurer, and the Rev. T. J. Bass and F. A. Fellowes joint secretaries.

At the last sitting of the Glasgow Dean of Guild Court yesterday, Lord Dean of Guild Gourlay made his annual report, stating that the number of linings granted by the Court during the past year was 498, and the valuations of these repairs amounted to the sum of £15,599,298. The linings for one-roomed houses had been steadily on the decrease during the last eight years, and the year just closed compared favourably with former years in this respect. The houses of one apartment were equal to about 20 per cent. of the houses of one and two apartments had been granted, and about 50 per cent. Nearly twenty years ago the late John Bright, in a rectorial address to the students of Glasgow, quoted figures to show that 41 per cent. of the houses in Glasgow were then in one apartment, 27 per cent. in two, and the 41 per cent. were of two rooms, bringing out the fact that 78 per cent., or four-fifths, of the houses were of two rooms and under. And at that period nearly one-third of the whole population of Scotland dwelt in houses of one room, and more than two-thirds in houses of two or more than two rooms. They had made some progress since then, and he trusted that the day was not far off when, in the interests of health and decency, the one-roomed house would be unknown in their midst. The value of the dwelling-houses and shops for which linings had been granted during the years just closed was £578,754. These were spread over the different outlying districts of the city, but only in the districts of Queen's Park and Maryhill—with three exceptions—were there houses being built having six rooms and upwards. The linings below £2,000, including the cost of the erection of a theatre at the corner of Bath and Elmbank-streets.

On Saturday, a farm near Gileland, on the borders of Cumberland and Northumberland, including the well-known Roman camp of Amboglama, was sold by auction at Carlisle. The property covered an area of 301 acres, and is let for £350 a year. The Roman camp upon it is one of exceptional interest. Part of the walls of the camp, the gateways are visible, and many altars and sculptured stones have been excavated. Recent explorations proved that the *cella* of the Roman wall sweeps round the south of the fort. The camp is situated upon high ground above the valley of the Irthing, and is 12 miles from Newcastle; and the district immediately around Birdswold is rich in Roman remains. The pro-

perty was ultimately sold for £8,000 to Mr. Joseph Wright, of Crosby, near Carlisle.

The annual Blue-book embodying the accounts of the working of the railways in India for 1900, just issued, shows that since the commencement of railways in that portion of the Empire more than half a century ago there has been year by year a steady increase in the surplus to the State of revenue over expenditure, amounting to nearly 8½ lakhs of rupees. During the year 1,237 railles were added to the railway system, bringing the total mileage up to 24,707 miles, and between the end of the year and April 30, 1901, a further addition of 1,000 miles had been made. There are also 78-44 miles of steam trams running outside municipal limits.

CHIPS.

The Cuckfield Isolation Hospital, near Burgess Hill, is being warmed and ventilated by means of Shorlands' patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

St. Peter's Presbyterian Church, St. Mark's-road, Sunderland, was formally opened on Friday last. The church, which has been built to meet the increasing needs of the Millfield district, occupies a site given to the Peter Darbhill Memorial Hall. It has cost about £4,000, and has seating accommodation for 450, and has been constructed by Mr. J. W. White from the plans of Mr. Neil Macara, of Rumbling Bridge.

The statue of William de la Pole, the first mayor of Hull, has been placed at the junction of Jameson-street and King Edward-street in that city, and stands swathed in cloth awaiting the unveiling ceremony, which will take place on the 15th inst.

Colonel Von Donop inspected, on Friday, the Cumberland and North, Shetland, and Tollerens, extensions of the Glasgow electric trams. The Alexandra-parade route of lines will be opened after inspection by Mr. Trotter, of the Board of Trade.

The statue of Gladstone for Manchester, by Signor Kuggi, has been placed in its pedestal in Albert Square, and will be unveiled by Earl Roberts on Thursday in next week.

Lord Ashton has handed the Mayor of Lancaster a cheque for £10,000, the estimated cost of the statue of her late Majesty Queen Victoria, to be presented to the people of Lancashire. Of this £10,000, £5,000 has been paid to the sculptor, Mr. Herbert Hampton, and the remainder will be invested in Corporation Stock, to form a fund for keeping the statue in repair.

Cardinal Vaughan will lay to-morrow (Saturday) the foundation-stone of the new Church of the Guardian Angels, Mile-end-road.

The Glasgow and West of Scotland Technical College authorities have received a letter from Mr. Carnegie's secretary, stating that, having seen that the £150,000 building fund reached some amount of £100,000, Mr. Carnegie would be pleased to give one-half of the deficiency, upon condition that the other half is promptly raised.

Plans for a new hotel to be built at the west end of Halifax, prepared by Mr. Lister, of A.R.E.B.A., architect, there, have been approved by the local authorities, to replace one of the old buildings removed for street improvements. The works are to be put in hand as early as possible.

At last week's meeting of the City Court of Civil and Criminal Justice, the Corporation of London Council submitted a petition for the erection of a room for burial in the City of London Cemetery at Ilford, at an estimated cost of £10,500. The Court decided not to erect a chapel, there being already one in the cemetery, and sent back the report to the corporation to obtain revised plans and estimates for the remainder of the scheme.

At St. Peter's Church, Middlesbrough, on Monday, the dedication took place of the new spire, designed by W. D. Carr, of York, and the expense of which the late Sir Rayleigh had promised to defray about £20,000. The spire has been completed at a cost of £700, and the interior of the church has also undergone renovation and decoration at a cost of £300.

In May last the nave of St. James's Church, Gloucester, was requisitioned for use by the Bath Corporation for carrying out repairs, under the direction of Mr. E. Buckle, of 23, Bedford-row, W. Since that date the Ecclesiastical Commissioners have taken the chance of having the floor has been laid with resting upon a bed of concrete. Oak sills, which had been laid in the nave under the direct (The whole has been carried out under the direct of the Ecclesiastical Commissioners, of London. The church was again taken into use as part of the church in connection with the harvest festival) September 18.

MEETINGS FOR THE ENSUING WEEK.

FRIDAY.—Architectural Association. Opening Address and Distribution of Prizes by the President, W. H. Stott-Smith. 7.30 p.m.

THE ARCHITECTURAL ASSOCIATION.

OCTOBER 11th.—ANNUAL GENERAL MEETING at St. James's Hall, London. The President, Mr. W. H. Stott-Smith, will preside. The Secretary, Mr. J. H. Stott-Smith, will preside.

Exhibition of Students' Work, Prize and other Drawings. The Secretary, Mr. J. H. Stott-Smith, will preside.

THE EVENING SCHOOL also opens on OCTOBER 11th. The Secretary, Mr. J. H. Stott-Smith, will preside.

OCTOBER 10th.—Preliminary Meeting of the School of Design at St. James's Hall, London. The President, Mr. W. H. Stott-Smith, will preside. The Secretary, Mr. J. H. Stott-Smith, will preside.

Mr. J. H. Stott-Smith, will preside. The Secretary, Mr. J. H. Stott-Smith, will preside.

Mr. Carthage, Chief Inspector of the School of Art, South Kensington, met the town council of Peterborough on Wednesday for the purpose of fully considering the plans of the proposed new school of art to be founded in Broadway.

A new junction station at Stourbridge was opened for traffic on Tuesday. The building, which has cost with approach roads £100,000, has been erected by Mr. Herbert, builder, of Wolverhampton.

The Northampton Town Council, at a special meeting on Monday evening, unanimously decided to purchase the Northampton Tramway Company's undertaking for £237,500. The sale includes the permanent way, stables, cars, and horse-drawn.

Mr. Leonard King has left London, on behalf of the British Museum, for the purpose of inspecting the mounds at Konyunlik, the traditional site of part of the city of Nineveh, and reporting on their condition.

Official information has just reached Mr. Edwin O. Sachs, Chairman of the British Fire Prevention Committee, that a large silver portrait medal, accorded by the German Emperor, in connection with the Fire Congress of June last, has been presented to the executive of the committee as a mark of appreciation for the services rendered by that body in the demonstration of scientific and economic aspects of fire protection.

The Stourbridge Urban District Council discussed on Monday a report from the Housing of the Working-Class Committee. The committee expressed the opinion that the services rendered by that body in the demonstration of scientific and economic aspects of fire protection.

The Archbishop of Canterbury laid, on Tuesday, the foundation-stone of new girls' and infants' day-schools at St. Peter's, Thame, in course of erection at an expenditure of £3,000.

The Holmecliffe estate of building land at Bisham, near Blackpool, was put up for sale by auction on Monday in 130 lots. No sale was effected. A compromise of the site of a proposed hotel, for which a provisional licence has been obtained, did not fetch an offer.

At Dewlish Church, Dorset, a stained-glass window and an organ have been dedicated as a memorial of the late Hon. Raymond de Montagu, V.C., who was killed in action at Stormberg, in the Boer War. The window, of two lights, containing figures of St. Michael and of St. George. The organ has been built by Messrs. Bryceson Brothers, of London, and is contained in a case.

In the case of the application on behalf of Charles Henry Barnes, Inspector of the East, E. H. N. L. of Coventry, builder, the order of discharge from bankruptcy has been suspended for three years ending August 26, 1903.

The death occurred last week of Mr. John Thomas Verge, builder, of Bridge-road, Southampton, at the age of 50. Mr. Verge was the son of a drum-major of the 2nd Volunteer Battalion of the Hampshire Regiment, from which position he retired a few years ago.

A Local Government Board inquiry was held on September 27, before Mr. C. E. Norton, I.R.E. Inspector, into the application by the Bury and Town Council for power to borrow £27,000 for the purpose of carrying out a provisional order for the lighting of Bury with electricity. Mr. W. H. Trentham, electrical engineer, explained the plans and proposals.

Trade News.

WAGES MOVEMENTS.

BRADFORD.—There is a prospect of the dispute in the Bradford building trade being settled at last. A conference took place on Friday between the representatives of the masters and the men, and as a result of the meeting the masters will place certain suggestions before their association. The terms as suggested by the men are that if the masters will withdraw the proposed alterations in the rules, the men will be recommended to accept a reduction of a 1d. per hour. The rules which the men object to most are those relating to the employment of non-union men, and the change in the date of notices dealing with alterations in conditions of work and wages.

PAISLEY MASONS' STRIKE.—About 60 men from Edinburgh have been imported into Paisley to take the place of strikers. They are both unionists and non-unionists, and have a six months' engagement. While the wage at Glasgow is 9d. per hour, and in Edinburgh 8½d., the masons in Paisley are striking for 9½d. The masters believe that they will now terminate the strike, which has lasted for three months.

CHIPS.

The annual general meeting for the session 1900-1 of the Society of Architects will be held at St. James's Hall, Piccadilly, W., on Thursday, the 24th inst.

The consummation of the Brockwell Park Extension Committee's labours by the payment of (about) £66,800 for the 43 acres of beautifully-wooded land adjoining Brockwell Park took place on Saturday last. The land was rescued from the builders' hands by the Extension Committee in August, 1899, and a provisional contract was secured by them for two years, terminating on Michaelmas Day this year. It now passes from the committee's hands to the jurisdiction of the London County Council, and will be made the property of the public for ever.

Lady Cecilia Turton formally opened, on Sept. 26, the new permanent cottage hospital in Grape-lane, Whitchy, built to take the place of the temporary hospital in Church-street. The old premises of the London Banking Company in Baxtergate were purchased for £700, demolished, and a new building erected at a cost of about £1,100.

At a meeting of Thornhill District Committee of Dumfriesshire County Council, on Friday, it was decided to adopt a new scheme of drainage and purification work drawn up by Mr. J. B. Little, C.E., Sanguhar, which will cost £1,600. The question of a joint infectious diseases hospital for Sanguhar burgh and Thornhill district was also discussed, and it was decided to spend £2,100 in additional accommodation.

Mr. A. M. Torrance, Chairman of the London County Council, on Saturday evening opened the Battersea Borough Council's Central Electric Generating Station. The installation, which is intended to supply about 150 lamps and eight-candle power as well as 240 incandescent light-candle power as well as 240 incandescent light-candle power, is arranged on the continuous current three-wire system, with a constant pressure of 460 volts across the outer conductor of the mains. The system has been laid down by the Crown College workmen, at a cost of £152,000. Professor Alex. W. B. Kennedy, F.R.S., was the consulting engineer. The constructional steelwork in built girders, joists, floor plates, riveted coil-hoppers, and other parts of the building was supplied by Messrs. J. Young and Co. (Ltd.), Eccleston Ironworks, Pimlico.

Readers of the *Free Lance* were recently invited to denote who, in their opinion, is the leading architect in England. The votes were distributed among a large number of names; but the first three candidates only are given as follows:—Mr. Alfred Waterhouse, 35 votes; Mr. Frank Matcham, 28; and Mr. T. Graham Johnson, 14. It will be remembered that the late Mr. Alfred Waterhouse held about fourteen years ago, more than 90 per cent. of our correspondents also placed the name of Mr. Alfred Waterhouse first.

Letters of administration of the personal estate and effects, valued at £10,723 15s. net, of Mr. Alfred Northcote Withers, of Westford, Westford, electrical engineer, who died on May 15 last, a bachelor and intestate, have been granted to his brother, Mr. Geo. Mitchell Withers, of 82, Netheredge-road, Sheffield, surveyor, one of the executors.

Mr. Trevel's plans for the Passmore Edwards Free Library and Technical Schools for Newton Abbot, in memory of Mr. J. Passmore Edwards' mother, have been finally approved. The buildings are very similar to those at Truro, also built at the expense of Mr. Passmore Edwards.

A new eight-day turret clock, showing the time upon one external copper dial, 1ft. in diameter, to the design of Mr. T. G. Jackson, architect, 14, Buckingham-street, Strand, London, has been erected in the new cricket pavilion, Cleggwick, the work having been carried out by Messrs. Wm. Potts and Sons, clock manufacturers, Guildford-street, Leeds, and Newcastle-on-Tyne, for Mr. Walter Morrison, J.P., Malham Tarn, near Settle, West Yorks.

The Earl of Northbrook (Lord Lieutenant of Hampshire) opened, on Wednesday week, a free library and technical school at Gosport, towards the cost of which the county council, of which he is chairman, has contributed £100. The Gosport Urban District Council has erected the building on a site acquired from the Crown at a total cost of about £500.

A meeting of the Queen's Memorial Committee for Hull was held on Friday, the Mayor presiding. The cost of the statue is not to exceed £2,750, to include all charges except the foundation work. Mr. H. C. Fehr was selected as sculptor. Promises to the extent of £2,500 have been made.

St. John's Free Baptist Church, with manse, adjoining, was opened at 11 o'clock on Wednesday. The church is 62ft. by 50ft., and is seated for 150 persons. Mr. Councillor Caley, treasurer of the church, acted as hon. architect, and the builder was Mr. Joseph Smith, also of Tunbridge Wells.

The Newcastle-on-Tyne city council received 57 applications for the appointment of city engineer, vacant by the resignation of Mr. H. Law, and have selected seven, from among whom a final choice will be made the week after next. The selected candidates are Messrs. John Robert Angell, borough engineer of Bermondsey; John Bryce, master of works, Partick, N.B.; John Rush Dixon, borough engineer of Wigan; William J. Steele, deputy city engineer of Bristol; and J. E. Swindhurst, city engineer of Coventry.

On Saturday the foundation-stone of the new schools which are being erected by the Baptists of Harborne was laid. The building, which is in close proximity to this chapel in High-street, is being erected on a site formerly occupied by three cottages. It will include a room capable of accommodating 250 persons, and three classrooms. At the rear there will be a room for class-meetings, and kitchen and wash-house. The cost of erecting infants' room is being enlarged. The total cost, including the site, will be £2,700. The architect is Mr. Arthur Harrison, and the contractors are Messrs. Halward and Co., Selly Oak.

Examinations qualifying for the office of district surveyor in London (Friday) to the provisions of the London Building Act 57 and 58 Vict. cap. xciii. s. 140) and of building surveyor under local authorities will be held by the Royal Institute of British Architects on the 24th and 25th inst. Applications must be sent to the Secretary, R.I.B.A., on or before Thursday next, 10th inst.

The business at the Tokenhouse-yard Mart last week showed a steady improvement. Building land sold readily, 25 acres on Lampton Hills, Hounslow, realising £888 per acre, and 12 acres, together with 16 houses and a fresh ground-rent of £22 10s. in Bury-street, Edmonton, £7,600. The total sales at the Mart amounted to £58,001, compared with £52,750 for the corresponding week last year.

The new infirmary in connection with the Retford Workhouse was opened on Wednesday week. The old infirmary was built by the Retford Board, and the Local Government Board inspector. The architect of the new building was Mr. W. Southall, and the contractor Mr. C. Jones. The building has cost £14,000.

Four statues to as many famous Frenchmen were inaugurated in various parts of France on Sunday. At Valence, a statue of Louis Gallie, the famous librettist was unveiled. At Roumainville, the person honoured (in this case by a bust only) was Paul de La Roche, the author of the *Le Livre de la Vie*. At Lyons, a statue of Jacquart, whose name is associated with the invention of machinery for silk weaving; and at Arbois, a monument erected to the memory of Pasteur, and dedicated to the memory of the French Republic.

At the Charterhouse School, Godalming, on Saturday, Major-General Baden-Powell, C.B., laid the foundation-stone of new cloisters and a vestry which are being built on the south side of the school chapel, as a memorial to old boys who have served in the South African campaign. The additions are being carried out from the designs of Mr. W. D. Caroe, F.S.A., and will harmonise with the Late Decorated work of the chapel itself, built from the late Mr. Philip Hardwick's plans in 1875.

We are pleased to learn from Canon Rawnsley that the famous requisites for the purchase of the Brandelov Estate on the banks of Derwentwater have been received or promised, and by the 15th inst. the picturesque wooded estate will have been secured for ever for the use and enjoyment of the visitors to the Lake District.

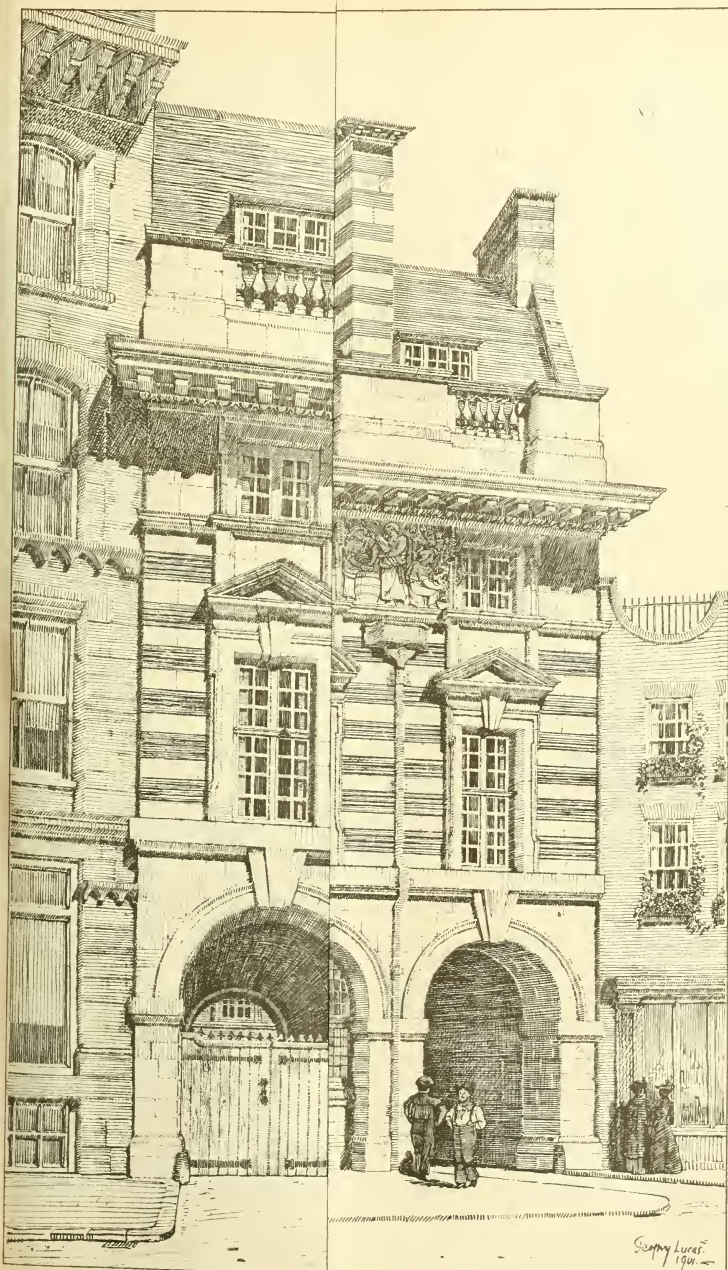
LIST OF COMPETITIONS OPEN

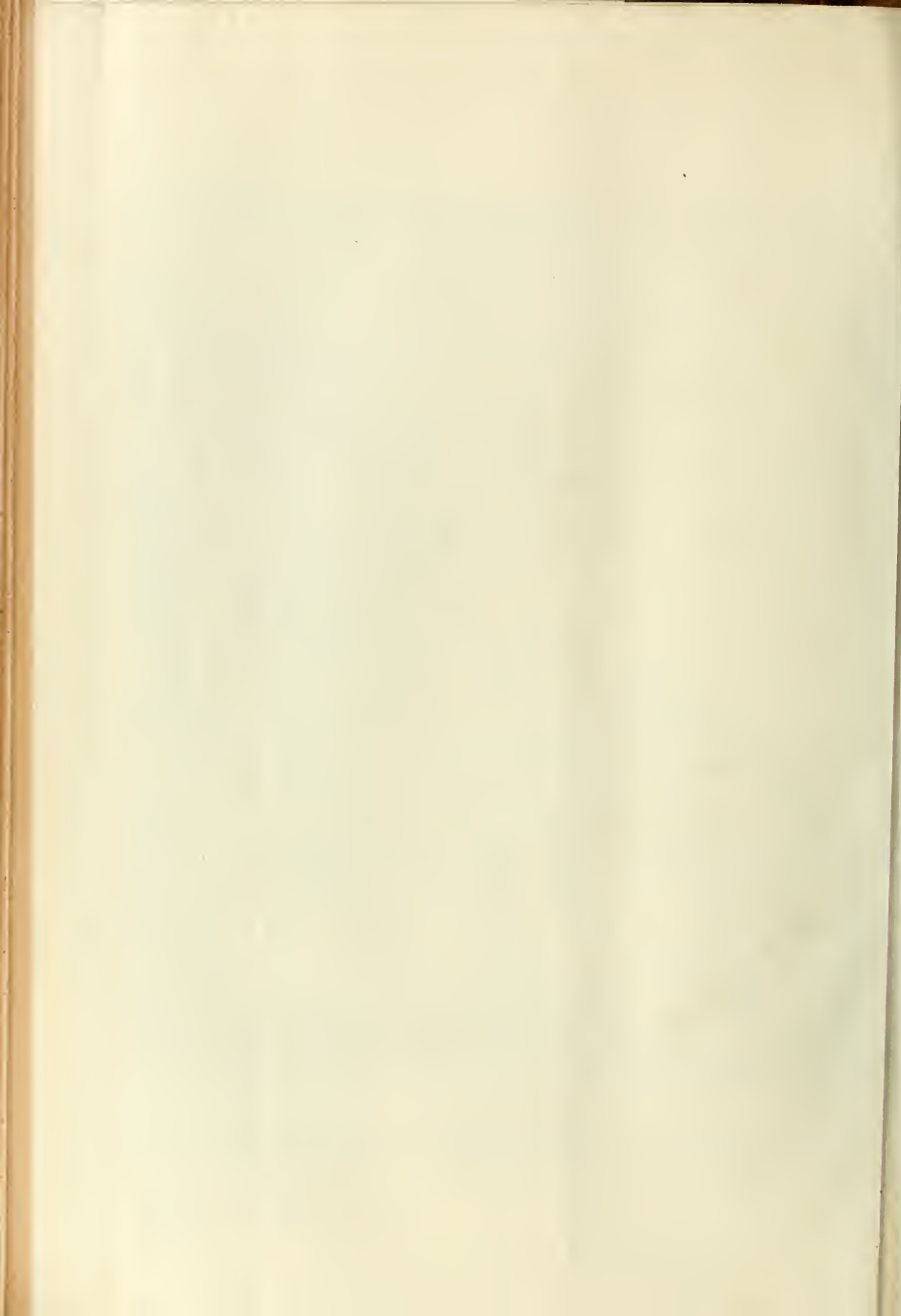
Camberwell, S.E.—Baths and Washhouses, Old Kent-road A. Saxton Smith, F.R.I.B.A., Architect	1598s., 756s., 532s.	The Town Clerk, Town Hall, Camberwell, S.E.	Oct. 2
London, N.W.—Hearts of Oak Society's New Office, &c. Enston road £15,000	£100 merged, £75, £50		
Bexhill—London Road	£20		
Bexhill—Upper Of 123, Lewis Road & Ornamental Grounds	£20		
Cardiff—Chapel, Cathedral-road cost £5,000			
Maidenhead—Mission Hall, School & Churchroom			
Gosport—Church School, 74 Park Lane, & 100 Park House			
Llandudnod W.C.H.—Laying Out Recreation Ground, &c.			
		Saunders R. J. Smith, F.R.I.B.A., 11 York Buildings, Adelphi, W.C. Nov. 1	
		E. Shatto Douglas, Clerk, Treen Hall, Bexhill	
		E. Shatto Douglas, Clerk, Town Hall, Bexhill	
		Thomas Evans, 102, Cathedral-road, Cardiff	
		W. R. Stevens, Woodlands-road, Maidenhead	
		Henry F. Vandenberg, Clerk, 183½ Northumberland	
		D. C. Davies, Clerk to Council, Llandudnod Wells	

LIST OF TENDERS OPEN

BUILDINGS.

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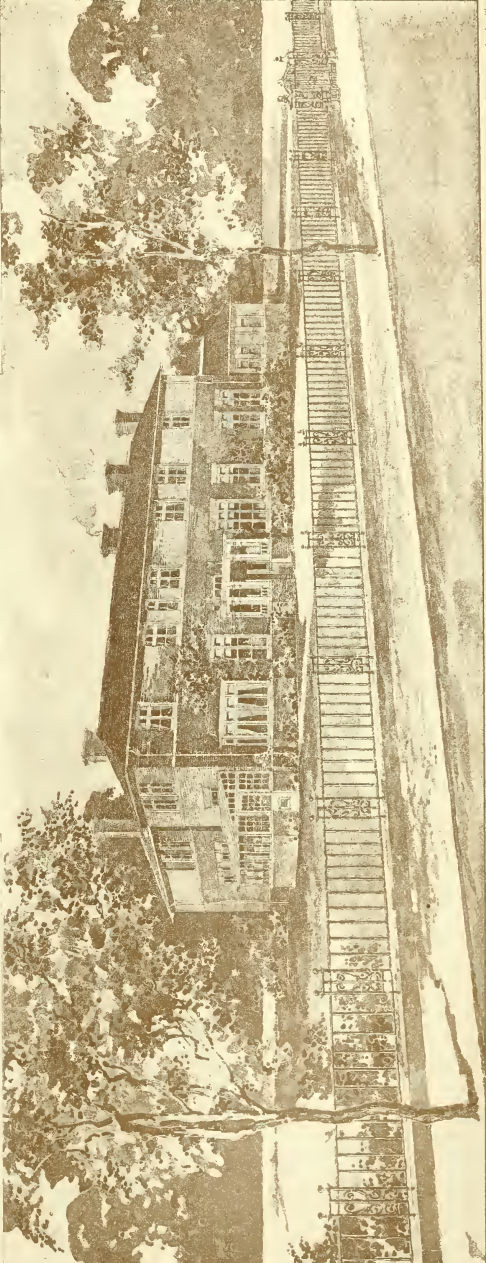
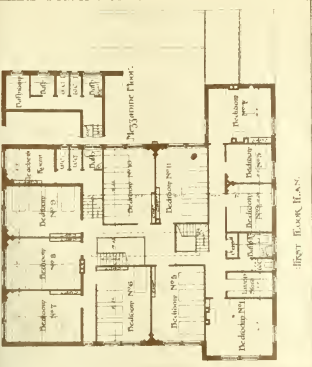
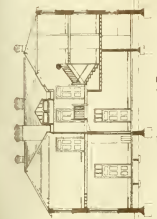
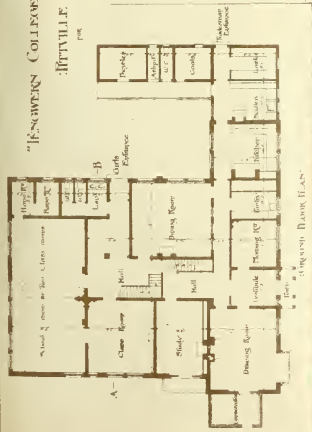




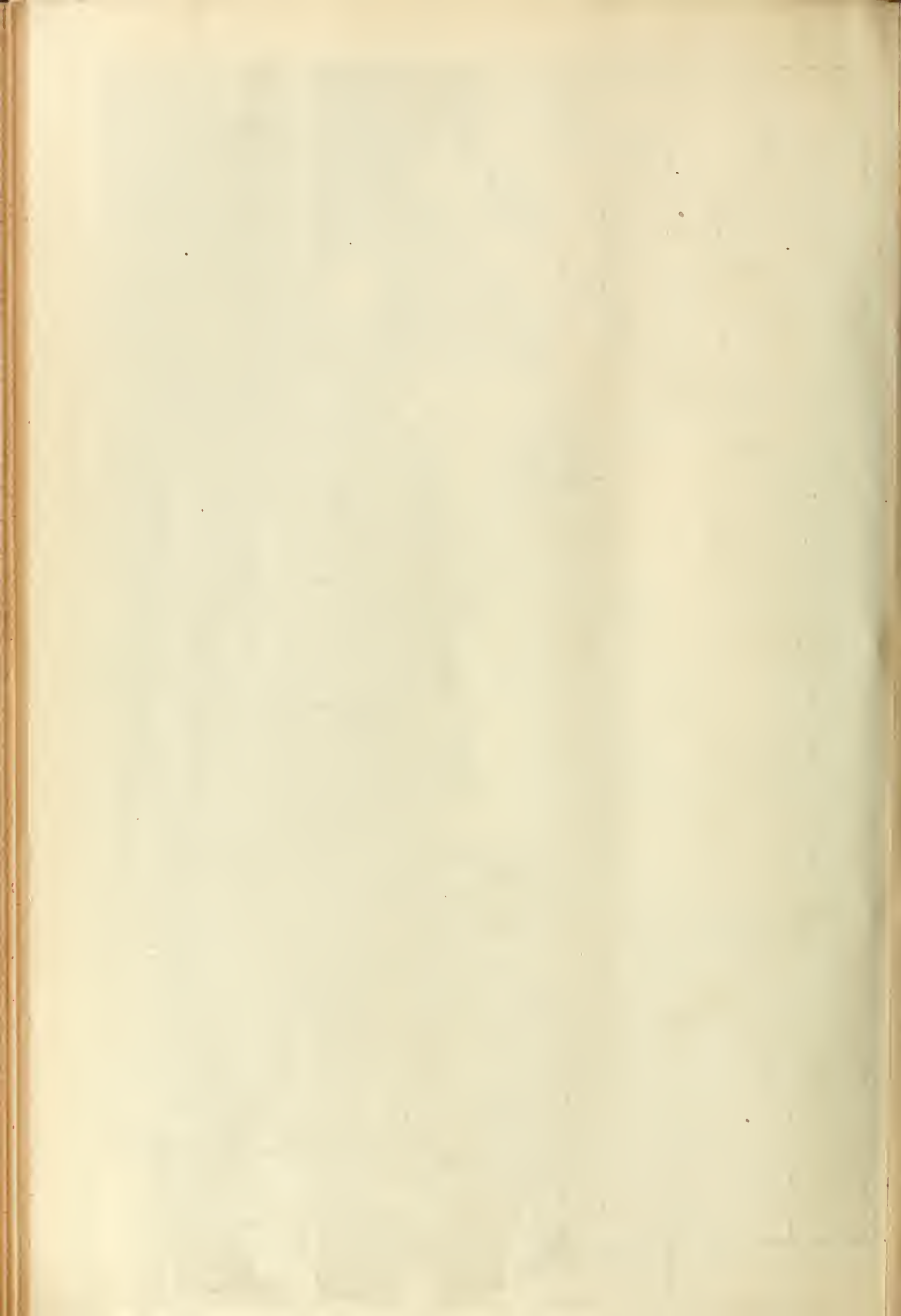
ST. MARY'S, OXFORD.

"JENKINSON COLLEGE"

111VILLE CIRCUS ROAD, CHELTENHAM,
"J.P. W. PEARSON"



J. HIGDON PEARSON, A.R.B.A. ARCHT.



THE BUILDING NEWS

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MODERN PRACTICE.

THE conditions of modern practice are strangely at variance with those of our predecessors, or which we most desire. It is even pathetic, if not paradoxical, to see the best men in inferior positions, and the big offices filled with those of quite another calibre—young men of art talent and aim making a bare living as assistants in offices which can do anything but the character of work they aspired to do, or filling positions of a very mixed kind. A singular perverseness has led many able men to turn their attention to making drawings or perspectives to the design of furniture or decoration; of others to enter into literary work, and others of less art, but of more business capacity, to fill important posts, or become leading members of large firms. We cannot account for this perversity. It is not due to education, for the most cultured have often been the first to submit to adverse conditions. We must trace it partly to a natural inaptness or lack of energy or organising ability—qualities which our predecessors possessed, but which our men have lost. They had the gift, the special gift, the young artist-craftsman quickly discovered his talents, and was attached to the particular guild. Men soon found out their own capabilities. They were not coerced by lecturers, examiners, and "coaches," nor spoiled by competitive examination—which fails to select those capable of the greatest development—nor robbed of their rightful position by the smartest but shallowest competitors.

On the contrary, the art was developed by those engaged in actual building, and each man found his place in this process. Compare this with the present method. The modern architect may be described as an isolated factor working in the midst of adverse conditions, trades, and industries: his circumstances and atmosphere have all changed. He is employed to put into shape the requirements of modern society and individuals. But how is he prepared for his work? Let us look at his school education and his pupillage. When the youth enters school or college, he may know nothing of his future vocation; it is in his imagination he has any idea at all. In the old days, the boy's early taste and inclination counted for something, and he knew the craft he was to be apprenticed to. The youth of to-day cannot always select his own vocation, so he is often drafted into a calling he cares for or knows nothing of. Such is the experience of many in the profession to-day. Many have drifted into it. Can we possibly say these conditions are favourable to success in the profession? Again, the school or college has not given the youth the instruction he is a want of; it may, indeed, have exercised faculties that would have fitted him better for a lawyer, or a doctor than an architect. And what is the average pupil's experience? Does he not also honestly find himself in the wrong office, amongst men who are his elders, and who have no time or inclination to instruct; or in an office where he is made a junior lackey, and expected to do odd jobs—nab up the ink, tidy the office, look out drawings, and run on sundry errands?—or it may be he is left to copy the letters and trace drawings from morning till night. If the pupil is ill-suited to the class of study, he may be one where there is very little to learn, or a big office where things are managed in such a mechanical and business-like way, that a pupil gets into

the wrong groove—one which he cannot work in with either profit or entertainment. He may be engaged in tracing or copying drawings, or squaring dimensions—things which may be useful enough, but do not teach the building art. As one writer has said, in such an office there is no time to think or study; everything is done in a hurry at high pressure. There is factory-like precision, but very little satisfactory work. It is this casting into the wrong groove of work that is so distressing to a sensitive or artistically-minded man. If he has any ideas, they are arrested or stunted, and he is reduced more or less to the condition of a machine. Plans of shops or warehouses or paltry alterations to houses occupy the mind of men who yearn for something better; or it may be working out to scale the rough sketches of the principal—all this in the dark without knowing the steps or the reasons why this or that is done. The draughtsman in a "mill" of this sort, forced to grind out platitudes, is doing violence to his own taste, and offers a pitiable irony. Even to work out his own ideas in the simplest detail would be better than this everlasting interpretation of another's design. There is more chance for a pupil whose master is engaged in practical work, and who is willing that his pupil should assist him in the design. But it is the humdrum and routine of the larger commercial office that is felt so keenly by youths of creative inclinations. And they do not practice often, not knowing the steps or the reasons for the "square man put in the round hole," and the round man in the square hole? How many able architects by instinct and training are now grinding away their lives in work of just the opposite character to that which they studied?—some of these are partners in firms doing a large surveying business, making valuations of estates, assessing dilapidations, preparing bills of quantities; others designing warehouses or shop-fronts; not a few employed by manufacturers of furniture and decorative materials as designers. On the other hand, men who possess no real talent, and whose art training has been of a very imperfect kind, have, by mere accident or pushing qualities, all kinds of important architectural work thrown in their way—churches, important municipal buildings, and the like. Why should this blundering distribution of work be possible? There must be some explanation for such a state of things, or that the largest building owners are lacking in discrimination or common sense. No utterly wrong recompense of talent or distribution of work could not exist under a system of art that encouraged individual effort or skill. Such a thing at least was not feasible during the age of Giotto or Michelangelo. But Revivalists, nor would it be possible now if the State encouraged art education. It is needless to give instances of architects employed on buildings for which they are very little fitted. Competition has been a source of such ill-assortment. We have, in fact, two modes of misdirected practice. There is indiscriminate in the appointment of architects. The successful man who has shown his skill in the planning of municipal buildings is commissioned to prepare designs for an important school, or even the church of an influential district. If he has really a good sense, it is inferred he can build a church equally well. How often the ecclesiastical expert with Gothic predilections has been selected for Government offices and civic works in which very different conditions have to be met. Did not the two leading Gothicists of the last century manage to "collar" the biggest prizes not only in ecclesiastical, but in official and domestic architecture, in spite of their principles? High promises and theories are inculcated about devoting one's talent to a particular phase for which the artist is most adapted: there is at least something more consistent and dignified in an eminent archi-

tect drawing certain limits as to his employment, yet it is remarkable to see how many break their professions when fortune smiles upon them. This indiscriminate practice is one of the distinctive points of modern architecture which mark it off from the old régime. In the Early and Middle Ages, the men who designed and raised the great edifices were entirely loyal to their training; they confined themselves to ecclesiastical and conventional buildings, and the result was a thoroughness, completeness, and unity in their work that cannot be mistaken. The craftsman was trained to one branch, and what he did was consistent and honest. But the modern professor does not limit himself; he practises in every branch of design as opportunity offers; he is ready to accept not only dwelling-houses, but public offices, churches, schools, banks, theatres, commercial buildings, baths, hospitals, and all other kinds of building, though of many of these he knows nothing. A writer in a Birmingham paper lately referred to the decadence of architecture in that city—demolition and rebuilding have been going on at a rapid rate; but the majority of erections are commonplace, and he concludes that the architectural profession is fast degenerating into a mere money-making trade, and the general public value the architect only for the quantity of work he can turn out. This decay of the art is largely explained by the grasping and indiscriminate policy we have mentioned. The practitioner who, however busy, takes everything he can get, really does injury to his art by underrating the study and experience necessary to the proper performance of the work, and he also closes the avenue to many men of genius. But such indiscriminate acceptance has another side. The scarcity of professional work encourages the less fortunate members to undertake buildings about which they know practically nothing. While the successful men in the profession take all they can, regardless of their competence and experience, the less fortunate, who have no choice of taking what they are skilled in, are compelled by circumstances to undertake work that is not to their taste or inclination. It is tragic to see an architect capable of the higher aspirations of design slaving over a set of plans for a union workhouse, or a set of washhouses—buildings he knows very little about; and it is almost a comedy, if it were not also sad, to find a borough engineer engaged upon work for which he has no qualification, such as a design for a town-hall or public offices.

The conditions that favour good design are not always to be found: locality and surroundings count for much. In this way many in the profession appear to lose all opportunity for doing good work. The provincial architect, often a man of ability, but little known, and who has studied often deeper and more thoroughly the art of his profession than the hurried Londoner can do, is obliged to take a class of work he is tired of—alterations to houses, local buildings of an unimportant kind, shop premises, and the like; occasionally, to get a little variety, and to occupy his pupils' time or rekindle his artistic genius, he goes in for a competition, but loses because of lack of smartness in the "get up" of the drawings. Then the ordinary provincial man is aware of the false impression made by successful competitors, by London names, and that local talent is seldom appreciated at its true worth. His estimates, also, are cut down, and his opportunities of exhibiting his architectural abilities are, in consequence, very much reduced. There are other limitations in country practice which appear to weigh upon the spirits of the practitioner, though they never did upon those local craftsmen of old days, who made their local materials and labour a source of power and often of charm. But things are altered: architects

are now all brought up in a spirit of rivalry, the local practitioner tries to copy the London practice, whether suitable or not, and so unreality and want of character prevail. Local conditions of building are not made a subject of study as they ought to be. Modern architecture is regarded as an art that can be applied to every locality and all materials without any modification, and therefore we find architects in the North surrounded by stone quarries, copying designs that originated in the South or brick districts. It has been said that all the art and taste is in the South, all the money in the North—a statement that is true to some extent, namely, that more attention is paid to art in its lighter forms of expression in the South, and such a decision has to be taken into consideration in discussing the conditions of building. There is little question that what is not expended in decoration and sculpture is spent in solidity and internal comfort in the Northern shires, whereas there is great deal of cheap ostentation and display in the South. A high class of artistic work is not favoured everywhere in England; thus it so happens that some of the more cultured men in the profession go and practise in the North, and carry their taste with them where they are a little out of their element, and it is like transplanting a Tropical flower to a Northern clime; their natural aptitude for art obtains no response amongst the hard-headed Yorkshiremen, and so it is their talents are wasted or uncultivated—a condition that could not have existed three or four hundred years ago, when architecture was indigenous to the soil.

When we examine more particularly the practice of architects in London and the provinces, we can trace the reasons for this want of local art. There is little encouragement given to the profession. Employers will have goods and fittings that they like, and, as we have seen before, the manufacturer is assuming a considerable position in modern architecture. To save expense or labour in designing, the architect or employer selects a design from a catalogue for decorative ceiling, or dado, or chimney-piece, and this is adopted. Very often in the provinces the manufacturer's agent or traveller, when he makes his periodical visit to an architect, obtains a half-promise from him that he will look at any design the manufacturer likes to submit for his approval—say, an ornamental plaster ceiling, or a leaded casement window for a particular position. The design in due course comes to hand, and the architect decides to adopt it, for it saves him the trouble of designing. Perhaps like many more, he has no idea of what will look well, so he eagerly accepts the offer. A plan of the ceiling or the elevation of window-lights are sent to the makers, say, in Birmingham; but, of course, they know nothing of the design or the surroundings of the building, nor perhaps anything to guide them. The particulars are put into the hands of a designer of the firm, who is equally ignorant of the building or its purpose, or the amount of light required. It is a miracle if the design turns out well. There is a lack of motive in the arrangement of ceiling panels they have been guessed at, in the absence of the elevation of the room and the position of chimney-jambos or windows; or the design for the leaded glass has no motive, or has not taken into account the object of the room. So in ironwork of an ornamental kind. How is it possible for a manufacturer, say, Birmingham to give a satisfactory design or sketch for a decorative balustrade in iron or bronze for a building in the South of England without a study of the design and plan and the style of the work. Even if these conditions are all known, there is the need of sympathy between the building and the designer's work. A firm of manufacturing metal-workers at any of the great iron centres cannot be

expected to be cognisant of the style of design chosen by an architect; there must be apparent in any such work an unsympathetic note. The design may be too coarse or heavy, or conceived in a spirit very different to that which the architect desired. However talented the designer of the firm may be, he cannot be expected to satisfy the architect's expectations, because he is working hundreds of miles away in the midst of very different conditions of art. How can we seek for a remedy for this condition of modern practice which dissociates the best and ablest men from their special work, and bring the profession into contact with manufacturers and craftsmen who have real sympathy and architectural perception? In our present circumstances we can only do this by an attempt to qualify students in directions suitable to their abilities. The master or firm who takes pupils may attach them to those departments of work for which they show a natural leaning, instead of putting them to tasks of an indiscriminate kind. So, too, the colleges and classes for students may do more to assist the student to pursue his own branches of study, instead of requiring him to go through courses of miscellaneous knowledge, a great deal of which he will have no opportunity of applying. Architects and firms will be consulting their own interests in encouraging the pupil to follow his particular inclination. It would be a satisfaction to find the Institute had established a class of members to be called "Craftsmen R.I.B.A.," as proposed by Mr. Aston Webb at some time ago, as we see the Birmingham Architectural Association, are admitting a class of members under the name of "Associated Craftsmen." These movements, and their reciprocal effects on the profession, are in the right direction, they will bridge the gulf that now divides the architect from the building craftsman, and in time cannot fail to improve the conditions of the profession.

THE HOUSING QUESTION.

THE Conference opened under the auspices of the City Improvement Committee of the Corporation of Glasgow, over which the Lord Provost presided, and which was attended by delegates from all parts of the kingdom, dealt with many questions bearing on the Housing Problem. The corporation of that city has been one of the foremost in dealing with the problem. Dr. Chisholm, in his opening remarks, defined the housing contemplated as the "minimum of accommodation and convenience which every man and every family had a right to expect, and the poor were those who, by reason of their poverty, would, if left to the ordinary law of supply and demand, be forced to accept less than that minimum"—a principle that did not apply to housing, the demand for which was imperious. As a matter of fact, the action of this law of supply and demand had built up the "backlands" of Glasgow, and crowded tenants together, and would, if controlled by a stern law, have persecuted narrow lanes and sunless rooms that were a scandal to our communities. Experience had shown that landlords, if left alone, would not provide the best accommodation at the lowest price. The law of supply and demand had not solved the problem in any satisfactory manner. In Glasgow the population largely consisted of one and two-apartment houses. Out of 156,000 occupied houses, Precpector Gray said 36,000 were of one apartment and 70,000 of two. The speaker said that the author made a few remarks that are worth quoting: "It was said 'The earth is the Lord's and the fulness thereof,' but we had come to experience that the earth belonged to someone else. In Good Queen Anne's time an Act was passed which declared that to every labouring man's cottage there must be allotted at least four acres of land." The

suggestions as to acquiring land at the lowest possible cost, and for obtaining capital for it, and the erection of buildings were summed up under certain points: (1) voluntary effort; (2) proper utilisation of present land; (3) duties of corporations; (4) duties of Parliament. To illustrate the first point, voluntary effort by the method originated by Peabody, Guinness, or Calbury was cited, by securing land and erecting dwellings for the labouring classes at a small rental, and without profit. Or the municipalities could erect the houses and become landlords for the public. The second point insisted that corporations should have power to call upon owners of slum property to clear the land of unhealthy property which menaces the population. The land should be brought into public use, and it ought to be acquired for the value of the land—not according to rental value. The speaker also thought that local authorities, in securing land for parks, &c., should see that it was secured untrammelled with restrictions against buildings, so that a proportion of the land could be occupied with houses for workers; also that authorities should have increased powers over owners of land. Both the latter suggestions would give rise to discussion. Land acquired for parks and open spaces would be spoiled by the erection of tenements over a part of it; the last point would prevent landowners in towns and suburbs who had parks and tracts of land from keeping them open for some years, holding them from speculating landlords till the market increased in value. Further, the preservation of land is rather a gain than otherwise, for it prevents the inundation of our suburbs with inferior buildings, and arrests the degradation of the neighbourhood till a time when the land can be put to a better advantage. The powers recommended by the Housing of the Working Classes Act, 1885, were also thought desirable. It was also declared by another speaker that the Glasgow Corporation had experimented in vain. He admitted that the value of the land, the value of which was increased by the community, or the prosperity of the city, and therefore the latter should share in its increased value.

The more practical question of the class of building necessary to meet the demands was discussed. Mr. A. B. McDonald, city engineer of the corporation, in a paper dealing with the materials usable for, and the various feasible modes of construction which could be adopted either for small cottages or houses in flats at the lowest cost, pointed out that his paper dealt, not with the materials and construction best adapted for dwellings of the working classes, but one quite different, and that had not been investigated. He meant the rehousing of that thermometer unit of the population whose lives were passed under conditions that ignored alacrity and comfort; whose dwelling, devoid of all the necessities of a home, was the normal refuge of zymotic disease, and whose existence was a menace to the public health. Could that unit be displaced and rehoused under improved conditions without involving a charge on the community? Answering this question, which, he said, could be rigorously investigated as a problem in applied mathematics, Mr. McDonald stated that the law required 1000 ft. of space to be provided for each adult; but the facts showed an alarming transgression. One room in Marlborough-street, rented at 1s. 6d. per week, and occupied by three adults, was found to contain 65, of whom four were lodgers, the cubic space allowed being 202 ft. for each. Other cases mentioned of rooms certified for a certain number of inmates had a cubic space of only 171 ft., and even so low as 100 ft.; others had even lower allowances. These were the conditions in which the "thermometer unit" found habitation. Such a type could not, however, be

housed in the same manner as the occupant of the improved dwellings erected by the corporation of Glasgow. Our present-day arrangements and methods of construction could not be applied to such inmates. These nethermost units of humanity had practically, by overcrowding, reduced the rent charge to a fourth of what the landlord exacted, or as low in extreme cases, as 6d. per week. To provide for such a house to satisfy the law was impossible, even if the site cost nothing. The author shows clearly enough that structures of a special type must be provided, where everything was reduced to the simplest form, and everything that was not necessary must be discarded. He says a weatherproof shelter with ample space and sanitary accommodation, but little else, the whole so rigidly plain that some relaxation of the Building Acts might be required, would suffice. Three different classes of houses of one, two, and three rooms are suggested—the plan consisting of a "balcony access with a central stair, providing on each floor 10 apartments, and 40 altogether for the three stories, the limit of height proposed. Every room is to have 1,200-cu. ft. of space, without measuring the bed recess. The walls are proposed of brick, with hollow space, say two half-brick thicknesses, and cavity; the partition-walls also to be of plain brickwork. It is stated by the author that a tenement of this description could be easily erected for £1,100, and the houses let at 1s. per room per week, yielding a rental of £78 per annum. The ground required for each tenement would cover 1,000 sq. ft. The proportion of street frontage to the building would be 1:2, and interest on cost of erection at 3½ per cent., there would be a "surplus sufficient to meet a charge of 10s. per yard for the site." And the work is best let to one contractor able to deal with the tradesmen. The author thinks such houses built on a large scale would make a sufficient saving to meet all charges for laying out and paving the streets. Land could be had in Glasgow in some parts for a lower price than 10s. per square yard. Such a scheme is at least worth trying, and might be commended to the London County Council, who have been putting up a class of tenement that is much above the "nethermost unit" of the population. The class of tenant which has created the difficulty is the one for which the ordinary methods adopted in London and elsewhere are unsuitable, and the sooner our authorities realise the fact the better. The tenements must, if possible, be built of the strongest and cheapest material possible. Brick is perhaps the best, though the partitions might be of concrete or some other equally strong and impervious material. Floors and roofs should be constructed in the least expensive manner, and in a non-combustible manner, and the window and door fittings, and the lining of the simplest and strongest kind compatible with use and cleanliness. All angles should be avoided. The plan, too, cannot be too simple and direct, and, we may even say, has not yet been quite realised.

At Glasgow a good deal of honest effort has been made in housing the poor. The Workmen's Dwellings Company, we are told, bought land at £2,800, and erected dwellings which cost £17,000. On Haghill a class of dwellings are built that is a near approach to the solution as regards a certain class, but something different is necessary for those who now live in a crowded and insanitary condition. At Cathedral-court houses on the balcony system and tenements of two rooms in Greenhead-court may be cited as useful experiments. The question of cheap ground is not entirely the point; it is one also of erecting houses for this particular class, or as a commercial speculation tenements of the kind cannot be put up. Miss Octavia Hill takes the slum houses, and seeks to improve them and make them suitable, and this tentative plan that might be tried.

One thing is certain: that for tenements to be built of the kind suggested, the Local Government Board and building by-laws would have to relax their requirements. Building materials have gone up to an extent that precludes the possibility of building cheap tenements. One suggestion made about the land question was to take it on the rent basis; but if the term of repayment was extended to, say, 80 or 100 years, the difficulty would be partially met. The cost of land in London weighs heavily on the promoters of these schemes. We have it on the authority of Mr. Waterlow, the Chairman of the Housing Committee of the L.C. Council, that they had to pay for clearing an insanitary area between 15s. and 17s. per square foot, and when cleared it was worth, in the crowded parts of London, about 10s. per square foot, and for housing purposes 5s. per foot.

The Conference discussed the chief points of the problem, the main ones being cheap accommodation for dwellings for the poor, tenants that have not yet been considered by promoters and municipal authorities. Glasgow, Liverpool, as well as London, are yet far from a satisfactory solution of the question. There are some who think that the class to be considered are those who are earning 18s. to 23s. per week, and that the lower and more numerous class, the "nethermost unit," are beyond the care of the municipality. Others there are who contend for a class of accommodation that will provide for this surplus. Of course, this is a point that must be cleared up and settled before any satisfactory scheme is considered. After this the question is obtaining land at a moderate cost, and of building dwellings at a rate that will provide accommodation for men and women who are earning less than, say, 25s. per week. The houses built in many of our large towns, and upon land at a very moderate price per foot, cannot, if we are to accept the evidence before us, be let to men who are earning less than 30s. to 40s. a week; but such a rent as this figure implies is quite prohibitive to the mass of poor people in our great towns.

TWELVE MONTHS' WORK OF THE LONDON COUNTY COUNCIL.

THE London County Council reassembled at Spring-gardens on Tuesday, after the summer recess, when the Chairman, Mr. A. M. Toller, delivered his annual address, in which he reviewed the work done in all departments during the past year. The urgent need of a new county hall of adequate size was emphasised. The staff at the central offices now numbered 803; more than half the staff of the central offices was housed away from the main building, and, in some cases, in premises which were quite unfit to be used as offices. They were not built for the purpose, and such degree of adaptation as had been effected did no more than provide bare sitting room, without regard to office requirements. The present accommodation was utterly inadequate for the staff of the Council, causing great loss of power, owing to lack of concentration of the departments. The total yearly expenditure of the Council under the head of rent of central offices was £15,460, compared with £4,950, which was the rent paid in 1889. It was evident that the present position demanded change, and as the need was urgent, the remedy should be speedily undertaken. The cost would be large; but the time was already overdue when the largest municipal staff in the world should carry on its work in the existing surroundings. Dealing with the work of the Joint Drainage Committee, the Chairman said the quantity of sewage dealt with during the year was 81,679,630, 337 gallons, 2,424,000 tons of which, in the form of sludge, was taken out to sea. Bearing in mind that the main drainage system served a population of 3,147,000, it was not surprising that the Committee's expenditure amounted to £38,561. The Committee had submitted a scheme for the enlargement of the main drainage system at an estimated cost of £2,947,000, in order to provide for the enormous growth in population, and to reduce the number of storm-water discharges into

the River Thames. Of these proposals the Council had already sanctioned the construction of additional outfall sewers at a cost of about £1,263,000. Portions of the work, estimated at £180,000, had already been commenced, and the remainder would be proceeded with as soon as the necessary arrangements could be completed, the drawings of some portions being well advanced. Experiments were still being made in the bacterial treatment of sewage at the Barking and Crossness Outfall Works, and results were being carefully recorded, so as to guide the Council in arriving at a decision. The suspended matter in the sewage were practically entirely removed as a result of the biological treatment, but the microbes producing the chemical changes passed through the coke-beds in practically unaltered numbers. The Committee were considering whether, under all circumstances, the benefits derivable from the bacterial treatment would justify the very heavy outlay involved in the proposal. As to the bridges, the Rotherhithe Tunnel was rapidly leaving the preliminary stage, and Greenwich Tunnel was half completed. The reconstruction of the Ruxton Bridge was also being proceeded with. The Improvements Committee carried through the Council seven important improvements involving application to Parliament for powers, and in thirty-one cases of improvements to be executed by local authorities the Council adopted the Committee's recommendations, and the contributions towards the costs. The total net capital expenditure sanctioned in respect of street improvements was £647,769. Of these twenty-five improvements now being carried out by the Council, the two most important were the new street from Holborn to the Strand, and what was now known as the "Waterloo improvement scheme." In connection with the former, the Committee devoted during the year considerable time to the settlement of the architectural features of the buildings to be erected on the line of the improvement. Wherever possible buildings of historical interest were preserved, but when it was absolutely necessary to demolish them, the greatest care was taken to preserve the most interesting portions. Moreover, during the work of excavation, vigilance was exercised to secure and preserve any objects of archæological interest brought to the surface, a reward being offered to the finders thereof. The work of the Committee of the Council in respect of the county improvements already sanctioned and now in hand, or about to be undertaken, was estimated at £11,065,207, whilst the net expenditure, after deducting recoupment, was estimated at £5,202,642. During the year a further 325 acres of land were secured for open space; one of the most valuable acquisitions being Archbishop's Park, Lambeth. In 1889 the parks and open spaces numbered forty, and cost £52,000 for maintenance. Now there were ninety-two, and the cost was £113,210. The acreage had increased in the same period from 2,656 to 3,853.

The Housing of the Working Classes Committee had had a year of great anxiety in their attempt to deal with the appalling problem of the present day. The growth of the work of managing the increasing number of working-class dwellings erected by the Council necessitated a consideration of the best method of providing for the efficient carrying on of the work. Without taking into account the numerous small estates to be managed, which would result from the Council putting into force the provisions of Part 3 of the Housing Act on a large scale, it was estimated that the number of persons employed in the management of dwellings would at no distant date amount to 248, and that the Council's yearly net roll would reach no less a sum than £101,000. In view of these facts, it was decided to establish a "housing department" with a "housing manager" at its head. If the progress made was disheartening to some, it would be seen from the report that large schemes were being undertaken with all possible speed. The Housing Committee had vast schemes in progress and under consideration. It would not rest content until every district in London was properly served with tramways. It was convinced that horse traction was doomed, that electricity must be the future power, and that the conduit system must be adopted. The year had also seen the completion of four new fire stations and the enlargement of three others, while a start had been made with the building of four new stations. In connection with the duties of the Building Act Committee, during the year under review 7,389 new buildings

were examined, for which fees amounting to nearly £21,000 were received, being the greatest amount in fees received in one year since 1881; 2,966 cases of dangerous structures were dealt with, and 680 summonses were issued in consequence of the failure of owners to comply with the requirements of the Council.

THE NEW CATHEDRAL FOR LIVERPOOL.

A MEETING of the executive committee in connection with the Liverpool Cathedral scheme was held on Monday, Sir William Forwood presiding. The proceedings of the building sub-committee were unanimously adopted on the motion of Mr. Robert Gladstone, who replied to remarks which had been made as to the rapidity with which they had decided on the style of architecture. That decision had been arrived at, he said, when they had a very full committee, including the Bishop and the Earl of Derby, and the subject was fully and seriously considered, and the decision was unanimously in favour of the Gothic style. No question was raised as to the possibility of any other style being adopted. He thought they had come to a very sound decision, because, however appropriate other architecture might be for some public buildings, there could be no question that Gothic architecture produced a more devotional effect upon the mind than any other which human skill had invented. He quoted what Sir Gilbert Scott had said in reference to Westminster Abbey. He hoped the committee would adhere to their decision. The building committee recommended that there should be an unlimited competition, and he thought it desirable to let those who had not yet built or designed churches have the opportunity of showing what they could do. It was decided that designs should be sent in before January 1 next, the committee reserving the right as to employing a professional assessor in making a selection of candidates for the final competition, and also the right to invite designs from architects, who did not take part in the final competition.

On the same evening, at the first meeting of the Liverpool Architectural Society since its incorporation, Professor Frederick M. Simpson, in his presidential address, referred to the decision of the Liverpool Cathedral Committee that the style of the cathedral should be Gothic. Without the slightest exaggeration, it might be said that the greater number of architects now practising in England were seeking employment in other directions than the Gothic. What was Gothic? Unfortunately Medieval detail was still regarded by some, especially by those interested in but not practising architecture, as constituting the Gothic style. But that was the wrong way to look at it. Construction, not detail, made a style. If the committee were content to depart from the recognised forms of ornamentation hitherto deemed obligatory and to allow the architect who designed and the other artists who assisted, a free hand in plain ordinance and detail, then possibly a building could be produced suitable to modern requirements and yet Gothic in the true sense of the word. But if the conventional Gothic was meant, then there was every danger that the finest opportunity which had occurred since the time of Sir Christopher Wren was going to be thrown away. They were not to hold that other arts were advancing while architecture was standing still. He did not believe that. The advance in architecture was as great as, if not greater than, in any other art; but restrictions such as that proposed to be inflicted rendered advance doubly difficult, and all they asked from the Cathedral Committee was fair play and a free hand at the beginning of this new century. If there was ever to be a new departure now was surely the time. Architecture more than any other art in existence suffered from a glorious past, and what should be a source of strength was converted into a source of weakness.

Mr. T. Myddelton Shalloo, of Dale-street, Liverpool, has written a long letter to the *Times*, protesting against the choice of St. James's Mount as a site, the selection of Gothic as the style to be followed; and the proposal to invite competitive designs for the building.

Any doubt that may have existed as to the fate of Little Abney is now removed by the definite announcement that the historic property is to be put up to public auction in London on November 26. The estate, including the domain of the ancient abbey, extends over 6,000 acres.

HOW TO ESTIMATE: OR, THE ANALYSIS OF BUILDERS' PRICES.—XXVII.

By JOHN T. REA, F.S.I., Surveyor, War Dept.

STAIRCASES.

Iron Treads, with Rounded Nosings and small Moulding beneath, and 1 in. Rise, gravel and rebated treads, glass, blacked, and bracketed on, and including strong Fire Carriages.—This is the ordinary specification which Fig. 16 illustrates. One complete step should be defined first, and

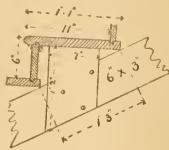


FIG. 16.

from this the cost per square foot found. Assuming each step to be 1 ft. long by 11 in., gives 6 ft. super. The included section of carriage which supports the tread and riser is measured on the slope.

LABOUR CONSTANTS.

Labour from bench, 1 in. treads, with rounded nosings and 1 in. rises, glued, blocked, and bracketed	per ft. super.	Hours of Carpenter
Ditto 1 in. wrought plain wall string	"	42
Ditto 1 in. wrought and fanned outer strings	"	48
Ditto 1 in. hand-rail, cross-cut, and matted ditto	"	45
Staircases, treads, risers, and bearers	"	25
Ditto fixing only	"	15
Ditto wall string ditto	"	20
Ditto outer-string ditto	"	10
Housing tread and riser, rounded nosings each	"	50
Ditto ditto moulded nosings	"	75
Ditto ends of moulded handrail	"	40
Ditto in handrail for balusters	"	20
Handrails, plain, 3 in. by 3 in., and fixed per ft. run	"	30
Ditto moulded ditto	"	75
Ditto add for rungs	"	42
Ditto ditto wreath	"	10
Ditto sinking for balusters, straight	"	12
Bar balusters, 1 in. by 1 in.	"	17
Ditto in steps for ditto	"	25

4.0	1.1	1.1	Ft. super, 1 in. deal tread, w.o.s., s.d.	0.103
1.0	—	at 2d.	"	0.103
0.6	—	—	"	0.1
2.0	2.0	Ditto 1 in. deal riser, w.o.s., at 2d.	0.4	—
24.0	8.0	Ft. run grooving for riser at 1d.	0.2	—
24.0	8.0	Ditto rebated edges of riser at 1d.	0.2	—
4.0	Ditto rounded edge to 1 in. tread	at 3d.	0.3	—
4.0	Ditto moulding at id.	—	0.4	—
2.0	Ditto deal blocking at id.	—	0.2	—
5.4	Ft. super, planing up at id.	—	0.5	—

4.0	1.4	—	—	—
1.3	0.4	—	—	—
0.8	—	—	—	—
0.2	Ft. cube rough fir carriage at 2s. id.	0.4	—	—
1	Rough deal bracket, 1 in. by 7 in., at id.	—	0.1	—
Glue and nails	—	—	0.1	—
Fixing 6 ft. super, at 15=20 hrs. carpenter at 10d.	2.3	—	—	—
5.6	—	—	0.6	—
0.6	—	—	—	—
6.6	1	—	—	—

Cost per foot super. 1.0
Housing to tread and riser is priced separately, for which allow 2d. per foot run.

HANDRAILS.

These are mostly made of mahogany, of which the following are the dock sale prices:—

Mahogany, Cuba, 1 in. thick	per ft. super.	s. d.
Ditto, Honduras	"	3 4
Ditto, Mexico	"	3 4
Mahogany, Cuba, 1 in. thick	per ft. super.	s. d.
Ditto Honduras	"	0 8
Ditto Mexican	"	0 8

To the foregoing, however, must be added cost of sawing, waste, and profit in conversion = 7 1/2 per cent., so that the timber merchants' charges would be:

The labour alone on Honduras mahogany is twice that on deal.
The labour alone on Spanish mahogany is three times that on deal.
Labour and materials in Honduras mahogany are three times that on deal.
Labour and materials in Spanish mahogany are four times that on deal.

4 in. by 3 in. Moulded Honduras Mahogany Handrail, and Faced.—As mahogany is valued according to the foot super, at 1 in. thick, the above line, by 3 in., section must be reduced to this denomination. And as a joint and handrail screw may be assumed at every 10 ft., such a length may be reasonably taken for the purpose of analysis, and the cost per foot run thus ascertained. Four inches wide by 3 in., this equals three in. thickness of 12 in., by 4 in. area per foot run, equals 1 ft. super, per foot run.

10 1.0	—	—	s. d.
1.0	10.0	Ft. super, 1 in. mahogany at 8 1/2	7 1
10.0	—	Ft. run sawing out at 3d.	2 6
10.0	—	moulding by machinery at 6d.	3 0
Handrail screw and nut at joint	—	—	0 2
Labour to cut joint, 15 hours carpenter at 10d.	—	—	1 3
Labour fixing 10 ft., 2 hours	—	—	1 8
17 8	—	—	—
10 19 3	—	—	—

Cost per foot run 1 11 1/2

Ripped handrail is worth twice straight.
Circular handrail is worth 2 1/2 times straight.
Rounded handrail is worth four times straight.
Labour on mahogany handrails equals 1 1/2 times that on deal.

Housing Ends of 4 in. by 3 in. Handrail.—This means housing the handrail to receive Balusters, or woodwork. A joiner can manage three in an hour.

3rd hour joiner at 10d.	—	—	s. d.
Add profit	—	—	3 4
Cost of each	—	—	4

Ditto, but on rake, are worth half as much again, or 6d. each.

Handrails to receive Balusters.—A joiner can do five per hour at 10d. in mahogany handrail, which with profit makes 2 1/2 each.

2 in. Turned Deal Balusters, banded and faced.—Take length at 3 ft., and include housing and fixing.

3 ft. run of 2 in. by 2 in. rough deal at 1d.	—	—	s. d.
Labour turning, ordinary pattern each	—	—	0 6
Fixing, 1/2 hour carpenter at 10d.	—	—	0 6
Add profit	—	—	1 4
Cost of each	—	—	1 12

Curial End to Bottom Step, and Hand.—Sometimes the curial block is made up of three pieces glued and screwed together, but here it is taken solid. Frequently it is billed "Extra for solid curial step," when less than half the following price would be sufficient.

Material, say 1 lb. cube of fir	—	—	s. d.
Making block, 4 hours carpenter at 10d.	—	—	3 4
Fixing block, 1 ditto ditto	—	—	3 0
5 7 1/2	—	—	—
Add profit	—	—	0 6

Cost of each 6 2

SKIRTINGS

1 in. by 9 in. Torus Moulded Skirting, and Faced.—Skirtings in large amounts are imported ready worked, or are kept in stock at the mills. They are sold at 10d. per 10 ft. run, with an allowance of 15 per cent. off list prices, which need not be reckoned, as it is swallowed up in waste to about the same extent. Taking 100 ft. in detail—

100 ft. run of 1 in. by 9 in. torus skirting	—	—	s. d.
Charge from mills to site	—	—	22 6
Cleaning up and fixing, 15 hours carpenter at 10d.	—	—	12 6
83 6	—	—	—
Add 10 per cent. profit	—	—	3 6
100 30 0	—	—	—

Cost per foot run 0 4 1/2

Fitted ends are valued at 1/4 of the foot run of skirting.
Housing ends are valued at 1 ft. run of skirting.

Mitred angles are valued at 1 ft. run of skirting.

ROOFING FELT.

Handsome Asphalted Roofing Felt, including 2 in. Laps, and fixed with Iron Clout Nails, weighing 3 lb. per thousand, plain 3 in. apart.—The felt should be laid longitudinally from gable to gable, the same way as the roof, so that the joints of the boards and the joints of the

felt parallel, which allows a free expansion and contraction of the boards without disturbing the surface of the felt. McNeill's felts are some of the best in the market, and their prices are:—

Incolorous or bituminous felt, for placing under slate, tile, or metal	£ s. d.
By 32in. wide	1 0 0 per roll
By 32in. wide	0 0 8 " yd. run
By 32in. wide	0 0 1 " sq. ft.
Patent asphaltic roofing felt, makes a light and durable roof of itself, for outside covering, in rolls 30 yards long by 32in. wide	1 0 0 " roll
Patent asphaltic, or slates' felt, for placing under slate, tile, or metal roofs, is of the same character as best, but thinner, in rolls 30yd. long by 32in. wide	0 15 0 " per roll
	0 0 6 " yd. run
	0 0 0 3/4 " sq. ft.

From the foregoing a manufacturer's discount of 60 to 65 per cent. is taken off according to quantities ordered; but for ordinary merchant's discount reckon only half these percentages. With 2in. laps, a square would require four widths (each 32in. or 2ft. wide) each 10ft. long, or 4 x 2ft. x 10ft. = say 107ft. super. of felt, including waste.

The nails used are iron clout, about 1in. long, and weighing 2lb. or 3lb. per thousand. They cost 1s. 4d. per thousand, and they should be dipped whilst hot in oil, or if convenient, heated in a shovel and thrown into grease, which prevents them from rusting afterwards. Galvanised ditto cost a trifle extra. At 5in. apart allow 170 to the square, with waste.

107ft. super. of incolorous felt at 1d. (less say, s. d.)	5 9 1
80 per cent. discount	0 9 1
Labour nails at 1s. 4d. per 1,000	0 2 1
Labour laying, zinc carpenter at 1d.	1 8

Add 10 per cent. profit	7 8 1
Total cost per square	0 9 1
This is a little more than the common contract price of 8s. 4d. per square, or 1d. per foot super.	8 6

MOULDINGS.

Numerous stock patterns are easily obtainable from the moulding manufacturer, so that the builder has merely to fix them. The trade discount on stock mouldings is often as much as 40 per cent. off list prices.

4in. by 1in. architrave moulding	per 10ft. run	6 s. d.
2in. by 1in. ditto ditto	"	4 6
2in. by 3/4in. ditto ditto	"	3 6
2in. by 3/4in. ditto ditto	"	2 6
2in. by 3/4in. ditto ditto	"	14 6
2in. by 3/4in. ditto ditto	"	17 6
2in. by 3/4in. ditto ditto	"	10 0
2in. by 3/4in. ditto ditto	"	7 6

Special mouldings made according to working drawings, are priced by the cubic foot, and Leaning says:—

"Some estimators adopt the following scale, which includes fixing and profit:—

2in. by 2in. and under	per ft. cube	12 s. d.
2in. by 2in. to 4in. by 3in.	"	7 6
Over 4in. by 3in.	"	6 0

For the value of mitres to mouldings the estimator usually adopts a proportion of the price of a foot run, as 1ft. for ordinary mitres, 2ft. for irregular mitres, &c. Sometimes a percentage, as 15 per cent., on the price per foot cube."

The materials for lead mouldings about equal the labour.

No. 1.—Tin, lead framed w.c., 1in. seat and riser, lid fitted with brass hinges moulded on edge, 4in. skirting, beavers, &c., 3ft. 6in. wide. Items may be put down thus:—

Lead-framed top	£ s. d.
3ft. 6in. super, 1in. deal seat 2fd.	0 3 0
ditto super, 1in. deal riser	0 1 1 1/2
Planing ditto	0 1 1 1/2
Painting ditto	0 0 11
Moulding edge of seat, 3ft. run, 6/12	0 0 10 1/2
Skirting about 3ft. run, 1/2 in.	0 1 4
Beaver, clamped, and frame, at 9d., say	0 2 3
Brass hinges	1 0 0
Labour, cutting and shaping seat	0 2 0
Beavers and fixing	0 2 6
Per set	0 16 9 1/2

Ditto, of Honduras mahogany, ditto, and price = 21 times above = 40s.

VARIOUS WOODS.

Ash.—Ash is seldom used by the builder, but it makes good and durable gates; works well into mouldings and delicate details; can be polished, and is suitable for handrails, small balusters, &c. It is, however, mostly employed for the handles of implements, as it stands rough wear and tear on account of its elasticity. The timber is economical to convert because of the absence of sap; but this should be done soon after the logs

are felled: otherwise deep shakes appear, and instead a heavy loss will be involved.

Ash sells by auction before felling at about 1s. 3d. per foot cube, and the merchant disposes of it in hewn logs at £8 to £11 per load of 50ft. cube, which equal 1 ton for ash. Scantlings are 1s. per foot cube.

Birch.—This wood wars very much on account of the irregularity of its fibre, and hence used for plugs for driving into brickwork. For this reason it should be employed in large sizes, or smaller pieces should be cut just before they are needed.

Elm realises 7d. to 1s. per foot cube before cutting down, and 55s. per load of 50 ft. cube in hewn logs afterwards. Scantlings are 2s. 6d. per foot cube.

Oak.—There are several varieties of oak, and the timber is very strong, hard, and tough, but cracks and warps a great deal in seasoning. This is especially so of English oak, which has been largely replaced by that of foreign growth. It is said to require a year's seasoning for every inch in thickness, and the oldest oak in ancient buildings will shrink if replanned. Foreign oak is preferable for internal joinery, as it works more easily, and does not warp or split so much as English. The latter, however, is the strongest kind.

English oak of average quality will fetch 1s. 6d. to 2s. 3d. per foot cube before felling, and it is sold by the merchant in hewn logs at 70s. per load of 50c.ft. Sawn scantlings are 3s. 6d. per foot cube, and even up to 6s. if the staff is of large size, dry, and well figured.

Baltic oak comes from Riga, Dantzic, Stettin, or Memel. Riga oak comes to England chiefly as wainscot logs, and is much liked for furniture, but is scarce. It costs from 75s. to 125s. per dry.

Dry wainscot, 1in. thick, costs	per ft. super.	s. d.
Ditto ditto 1in. doorboards cost	per square	4 8
Ditto ditto 1in. ditto ditto	"	45 0
Ditto ditto 1in. ditto ditto	"	55 0

Dantzic oak is grown chiefly in Poland, and shipped at the port after which it is named, also at the Baltic. It makes excellent firewood, being straight and clean in the grain, and is easily bent if boiled or steamed. Dantzic and Memel oak costs from 65s. to 80s. per load.

Austrian or Hungarian oak, shipped from Trieste, is now plentiful in the market. It costs 11d. per foot super. 1in. thick when sawn into planks or converted.

American oak is found from Carolina to California, and the variety mainly imported into this country is the White Oak, so called from the white colour of its bark. Quebec oak costs about 70s. per load. Labour on oak is twice that upon deal.

Labour and material are thrice the value of deal. Labour on oak carcassing is one-third more than on fir.

Labour to curved work is one-half more than to straight.

Waste on oak in conversion, because of its liability to twist, may be taken at 10 per cent. more than on deal, equals 20 per cent. in all for sawing. Conversion of Honduras mahogany joinery are supposed to be of equal value, but the former does not work so easily as the latter, and there is more waste.

To remove English-grown timber it costs 3d. per foot cube for loading and carriage four miles, and 1s. 6d. per ton by railway.

Yellow Pine.—This is otherwise known as Weymouth Pine, because it was first introduced by Lord Weymouth. It is sometimes referred to as White Pine, from the colour of its bark. The wood is light, soft, straight-grained, free from knots, takes glue well, and very easy to work. Hence it is most suitable for joinery and fittings, especially for drawers and panels of doors, being of a clear uniform yellowish colour. It is particularly adapted for ironfoundry patterns and castings. But the wood is not durable, especially when "dotted" with minute grey specks or dots, the result of disease. It grows in North America, and that shipped from Quebec has the best reputation.

Yellow pine is imported both in logs and sawn into scantlings, while planks can be obtained up to 30in. wide.

American yellow deals are classed as follows: Brights, 1st, 2nd, and 3rd quality, which have been sawn from picked logs, and have not been discoloured by being floated down the rivers, and are therefore of a clearer or brighter yellow.

Dry Floated, 1st, 2nd, and 3rd quality, which

have been stacked and dried before shipment after being floated down.

Floated, 1st, 2nd, and 3rd quality, which have been floated down the rivers from the felling grounds.

Quebec yellow pine in logs costs from 87s. to 125s. per load.

Yellow pine, when sawn into planks, deals, and battens is termed *Quebec* yellow deal. Seldom, but, as stated on a former page, yellow pine and yellow deal must not be confounded.

The prices at the dock wharves are:—

			standard						
			£	s.	d.	£	s.	d.	
Quebec yellow pine deals, 1sts			18	15	0	to	25	5	0
Ditto ditto ditto 2nds			13	15	0	„	17	0	0
Ditto ditto ditto 3rds			6	0	0	„	10	0	0

A fair average rate for First bright yellow pine deals from the above would be 20s. per standard.

With allowances for landing rate, unloading, sawing, conversion, &c., the cost would work out to 3s. per foot cube, and for thicknesses:—

Yellow pine, 1in. thick	per ft. super.	s. d.
Ditto ditto 3/4in. ditto	"	0 23
Ditto ditto 1/2in. ditto	"	0 31
Ditto ditto 1/4in. ditto	"	0 5
Ditto ditto 1/8in. ditto	"	0 51
Ditto ditto 1/16in. ditto	"	0 61

[NOTE TO MERCHANTS.—In answer to several firms, I wish to point out that these articles carry a long time to compile, so that by the time they were completed some quotations have necessarily been obtained. Prices, moreover, are perpetually varying, and what may be right this week may be wrong next, owing to a sudden change in the market. It was distinctly stated at the beginning that it was impossible to set forth fixed rates, and that the object of these papers was mainly to show builders the *benefits* of estimating. This is further indicated by the very heading of "*How to Estimate*," or the *Advantages of Builders' Prices*. Why, the mercantile discounts which merchants offer to contractors are alone sufficient to upset any trade list of prices, and builders wisely get quotations each time for exactness, which quotations vary in themselves according to the amount of the order and the standing of the customer, &c. Different firms have different prices for even the same article. Sometimes, too, full information as to list prices, discounts, &c., is refused to outsiders, as I found to my cost when applying for it. And there are trade customs, jealously guarded, not to inquire for people like myself.—J. A. Rice, Gordon House, Newbridge, Co. Kildare.]

(To be continued.)

TWO PRACTICAL HANDBOOKS FOR ARCHITECTS AND SURVEYORS.

THE late Professor Banister Fletcher's practical textbooks have had an unprecedented sale, some, of course, more than others. As time goes on, however, it is obvious that many such publications dealing more or less directly with legal procedures and interpretations of Acts of Parliament must grow out of date, necessitating new editions incorporating the latest information available. We have now before us the third edition of Fletcher's "Building Act, 1894-98," revised and enlarged by Messrs. Banister F. Fletcher, A.R.I.B.A., and H. Phillips Fletcher, A.R.I.B.A., barrister-at-law, of the Middle Temple. Mr. B. T. Batsford is the publisher. Some new plates have been added to illustrate the area of open spaces in or about buildings required by the County Council, and the regulations as to courts and heights of buildings. The revised rules issued by the authorities at Spring-gardens with regard to applications, sanctions, consents, and licenses which came into operation in 1899 are substituted for those previously in force, as also the revised Drainage By-laws, are given, together with the Regulations of the City of London, issued by one but those who have a constant and almost daily experience of the working of the London Building Act can be fully acquainted with the variety of, and sometimes contradictory, decisions and interpretations which have to be complied with in dealing with building regulations by the Metropolitan Board of Works, some district surveyors take, also different views, while some may be over-reaching and needlessly given to the application of their own ideas and practice. Even where no such personal peculiarities obtain, the complications following upon the rights of adjoining owners, claims of ancient lights, and local by-laws are ample sufficient to diversify the difficulties which always must assert themselves in all crowded areas and big towns when building alterations and new works are in progress. A practical and concise work of this kind, with its abstract of reliable references, is of the greatest possible use. We have the old story of a well-known professor who published a book on

this same subject, and who, on taking a case under the Building Act into court, was ultimately beaten. After the trial was over, the author of the book in question asked the surveyor on the other side how he came upon his precedents. "Why," was the rejoinder, "out of your own book!" The professor's literary work may have been detailed by deputy, or he may have forgotten what he once knew; but the answer he got spoke well for the utility of his little volume. It would be possible to go through the present book to discuss all the various questions with which it is incidentally brim full. The aid of its very capital index would be a great assistance, and adds much to the value of the book. The Act is given in full with schedules, and an introduction descriptive of the changes made in its own merits, which came into force and since. The abstracts set out in tabular form, giving direct and cross references, constitute the chief merit of this handy book, which might well find a place on the desk of every architect practising in London.

The same authors and publisher have brought out in a companion form a second edition of "Valuations and Compensations," with tables and rules for the valuing of property and compensations relating thereto. Each valuation, as the writers point out, must be made on its own merits, which, of course, vary with each individual case, and what is more, experts themselves vary very conspicuously in their estimates of the actual value in almost every case. The buyer and seller naturally take different views, and their advisers go a long way very often to increase their differences. Still, there are accepted rules, and short of a considerable experience, which can after all be claimed by comparatively few, the aid which Banister Fletcher's digest supplies cannot fail to be of great assistance. The examples of valuations which he gives in illustration of the various kinds of property, while a chapter showing the working out of these values is contributed by Mr. Richard Parry, F.S.I., A.M.I.C.E., giving an exposition of the structure of the Valuation Tables. The type is excellent, and the figures are clear and easily read, and, as a whole, the volume is of the greatest importance to the reader, who more often than not refers to a work of this kind when very busy or when in a hurry to clear up some point in question.

BURY ART GALLERY AND PUBLIC LIBRARY.

THIS building, to house the Wrigley collection of pictures presented to Bury, was formally opened by Lord Derby on Wednesday. The building is situated at the corner of Moss-lane and Silver-street, and has a frontage to Moss-lane of 110ft., and to Silver-street 160ft. The structure comprises three complete stories—basement, ground, and first floors, with a sub-basement under the rear for the heating and ventilating plant. The first floor is entirely devoted to art, and is approached from a sculpture hall on the ground floor by a spacious stone staircase. There are five galleries arranged in sequence, the sizes varying from 2ft. by 33ft. to 2ft. by 61ft. Provision is made for ladies and gentlemen's cloakrooms, lavatories, &c. The ground floor has been devoted to library purposes, and will be entered by a vestibule 14ft. wide from Silver-street. This vestibule opens direct into the borrowers' space, which is 40ft. wide. To the right of the borrowers' space swing-doors open into the ladies' and reference rooms, and to the left admission to the magazine and reading rooms is gained in a similar manner. The conveniences for the sexes are provided on each side of the entrance, and approached from the borrowers' space through ante-rooms. A librarian's room and a large book-store are arranged in conjunction with the borrowers' space, and at back of the building there are suitable rooms for book-repairing, &c.

The basement is chiefly devoted to floor space under the library, and connected therewith, by a spiral staircase, is a large book-store. At the rear of the building is a loading way for receiving books, pictures, &c., and a large open space for the loading way with all floor. A packing-room is also provided on this floor. The remainder is occupied by store-rooms for packing-cases, &c. The principal elevations are faced with hoisted ashlar obtained from the Higher Standcliffe Quarries, Driford Dale. The finishing, the prevailing elevations being faced with Edwards' Haydon best selected red bricks. The joinder's work

generally is Kauri pine, stained and varnished. The gallery floors are laid with oak parquet, the library with oak blocks, and the reading-rooms with pitch-pine blocks. The vestibules and halls are laid with mosaic floors, and the steps, landings, &c., for the staircases are blue Shepley, with bath stone balusters and handrail.

The building is of fireproof construction throughout, and lighted by electricity. Messrs. Thompson, Brickell, & Co. have been the principal contractors. The clerk of works was Mr. G. E. Smirk, of Bury. Among special tradesmen employed on the work are Messrs. Hardman, Twell, and Co., Birmingham (wrought-iron gates), and Mr. Geo. Wragge, Salford (protection rails, cranks, &c.). The iron and fittings were supplied by Messrs. Dainton and Co. of Leeds (Goodall, Lamb, and Heighway). The whole of the work, including the fittings, has been carried out from the designs and under the supervision of the architects, Messrs. Woolhouse and Willoughby, F.R.I.B.A., of King-street, Manchester, whose design was chosen in an "open" competition, and was illustrated in our issue of December 3, 1897.

THE ARCHITECTURAL ASSOCIATION.

DISCUSSION SECTION.

THE following is the syllabus of meetings for the session 1901-1902. The chairman is Mr. R. H. Weymouth, and the meetings are held at 35, Great Marlborough-street, on the Friday evenings stated, at 7.30 o'clock. The object of this section is to afford opportunities for the study and discussion of those subjects and difficulties which constantly occur in architectural practice. The Discussion Committee arranges for gentlemen of special experience in the subject to be discussed, to attend at each meeting, and at the close sum up the discussion.

1901.
Oct. 18. "Stables and Stable Fittings," H. Gregory Collins.
Nov. 8. "The Finishing of a Dwelling-house," W. E. 22. "Design in Furniture," Vivian H. King.
Dec. 6. "The Ethics of Disappointments," Sydney Peres.
29. "The Manufacture, Fitting, and Use of Portland Cement," H. Howard Humphreys.
1902.
Jan. 19. "The Work and Influence of Augustus Welby Pugin," P. W. Mulready.
21. "The Clerk of Works'—his Duties and Responsibilities," F. G. Ouse.
Feb. 7. "Stained Glass," J. Dudley Forsyth.
21. "The Organ: its Proper Position and Architectural Treatment," P. F. Edwards.
28. To be announced.
Mar. 14. "Superior Homes," H. C. Lander.
April 18. "A Tour in the South of France," A. Needham Wilson.

EFFECT OF CURVATURE UPON THE FLOW OF WATER IN PIPES.

THE paper by Gardner S. Williams, M.Am. Soc.C.E., Clarence W. Hubbell (Assoc.), and George H. Penkell, of the same society, printed in the *Proceedings of the American Society of Civil Engineers* for May last, on the experiments conducted on the effect of curvature on the flow of water in pipes, has been fully dealt with, and the discussion appears in the last issue of the *Proceedings*. The authors of this paper lay down the theory that the curve of velocity in a pipe is an ellipse, not, as generally thought, a parabolic curve, and this conclusion is substantiated by one or two others in the discussion. Mr. Irving E. Church has contributed a valuable investigation by letter to the discussion published, in which he points out one or two wrong assumptions of the methods to which we shall refer, and computes the amount of error in certain cases suggested by the Detroit experiments.

We have also valuable remarks made by Charles H. Tutton, J. L. Campbell, Chas. W. Sherman, D. Farriard Henry, and other members of the Society, which point to certain parts of the paper. Mr. Sherman points out that the authors have not sufficiently appreciated how large a proportion of the frictional loss of head in ordinary water-pipes is due to the joints, while short-radius curves contain few or none, and this would be one reason for the conclusion of the authors—that curves of short radius should be avoided in reference to the flow of water than curves of long radius. Mr. D. F. Henry thinks there must be something wrong in the deductions so opposed to accepted theories. "First, that the friction in pipes increases with the radius of curvature. The curve of the least friction is a parabola of 90° curve with a radius of 2 to 2.5 diameters, and

the greatest in a similar curve with a radius of 24 diameters. Can it not be legitimately concluded that a line of pipes through which the water will flow with the least friction must have as many sharp right-angle bends as possible? Second, that the locus of maximum velocity in a circular pipe may be anywhere except in the centre. The heretofore recognised theory in regard to this locus is admirably expressed in the following: 'When the velocity of flow has become uniform in an inclined pipe, the fillet which occupies the axis moves with the greatest velocity, because it is furthest from the cause of retardation, that is the outer walls.' Mr. Henry shows the same holds good in equal where the maximum velocity is at more or less depth below the surface, depending on angular canal it was in the centre vertical, and where the depth was less than one-fourth of the width it was at the surface; with the depth equal to one-half the width, it descended to one-third the depth. Other facts are given which make the conclusions of the Detroit experiment rather doubtful for acceptance. Another contributor (Mr. Church), referring to the paradoxical assertion that the maximum resistance would be found in the flatter of all curves—viz., in a straight pipe—observes: 'Closer inspection of the context shows, however, that the resistances compared were those occurring for the same rate of flow in a number of pipes of the same length (in diameter), in each of which only a fraction of the length was curved, so that a 90° curve of large radius occupied a much larger percentage of the total length than one of small radius, and that no attempt had been made to distinguish between the effect of angular deviation of flow (or curvature proper) and that of the length of the curved part of pipe. It was also noticeable that in a large number of the cases proper of the curved portion constituted only a small percentage (2 to 11 per cent.) of the total length of pipe, the remainder of pipe being straight.' Hence the length of curve, as with a straight pipe, would seem to be of importance. The writer offers a mode of interpreting the numerical data in the table given by the authors of the paper that appears sound.

WATER SUPPLY.

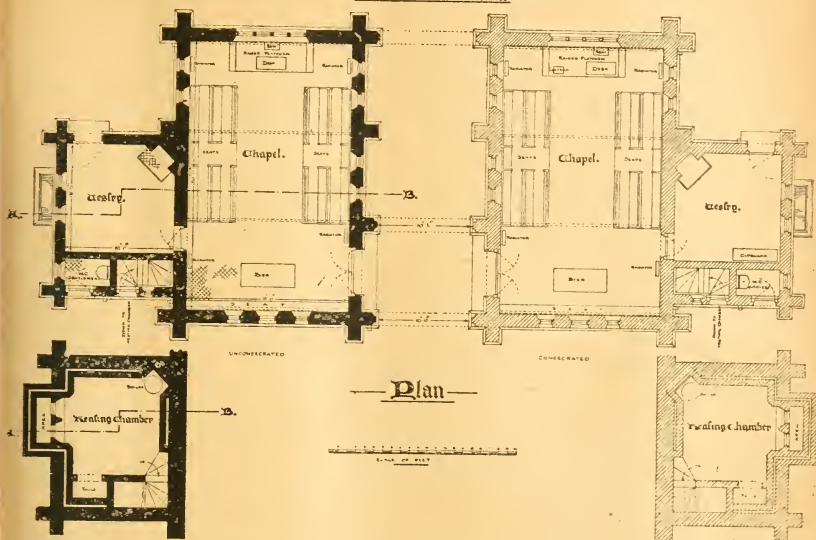
AT a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday evening, October 7, Mr. Charles Mason, president, in the chair, a paper was read on "Innominating Water Supply," by Mr. Sydney A. Hollis. The author first pointed out the difficulties which were encountered by engineers in Tropical and sub-Tropical countries in the gaugings of rainfall and rivers. Some statistics of remarkable and erratic rainfalls in the Cape Peninsula were given. The author then gave a detailed account of the gaugings carried out by him at Steenbras River, Cape Colony. He stated that the gaugings were taken with a view to the ultimate formation of a large storage reservoir by means of a dam across the mouth of the valley, the object being to store the surplus of water in the sub-basins of Cape Town. A large gauge weir was erected, measuring 60ft. across, and it was found that the flow of water in the river fluctuated between half a million gallons and 300 million gallons in the twenty-four hours. A description was given of the method adopted to measure the flow of water in winter and summer, with particulars of the number and position of the rain and evaporation gauges.

A paper was also read on "Irrigation Works in South Africa," by Mr. J. Freebairn. The author first referred to the report of the Royal Commission on the settlement of time-expired soldiers and others in South Africa on the conclusion of the war, and pointed out that the commissioners were strongly impressed with the value of irrigation works being undertaken in order to convert the vast areas of dry veldt into an agricultural site, capable of producing produce for intending settlers. The author then drew attention to the persistent attempts made in 1880 by the late Mr. H. S. Orpen, at that time Surveyor-General of Griqualand West, to the effect of the day to take up the subject of irrigation works.

The author then described the first scheme of irrigation ever attempted in South Africa on a large scale, and referred to the failure which attended the project. It then gave an account of the various papers and reports of the late Mr. Orpen, and the efforts of the late Mr. Orpen to irrigate the veldt in the vicinity of Douglas,

Design for a Cemetery Chapel, Bexhill.

for The U.D. Council.



town about eighty miles to the south-west of Kimberley. The author then described the ingenious and somewhat rough-and-ready means adopted for the construction of the masonry dam across the Vaal River, and pointed out the engineering difficulties encountered. The employment of convict labour was referred to, and stress was laid on the benefits which accrued therefrom. The use of explosives in the blasting operations, necessitated by heavy rock cuttings, and the methods adopted for crossing the valleys and running the canal round the kopjes, were described, and the difficulty of insuring a safe passage across or under the irrigation canal for storm water from off the numerous kopjes was also discussed. The manner in which the last sections of the masonry dam were built in was described, and the author gave examples of the way in which engineering work in a rough country was carried on, and how plant and material were transported where railways were unknown. In conclusion, he referred to the favourable attitude of the Government of Cape Colony in respect of irrigation works.

CEMETERY CHAPEL, BEXHILL.

THE accompanying drawings show the accepted design for the cemetery chapel to be built at Bexhill. The buildings are intended to meet the requirements of the Church of England as well as Nonconformist services. The work indicated by the walls being shown black is intended to be erected. The heating chamber could also be used for tools, &c., the walls to be built of concrete with cavity, the floor and steps to be of concrete, finished with a thin cement paving. The floor of chapel and vestry to be of wood-lam flooring. The outside walls are to be built of well-burnt bricks and faced with rubble and Monk's Park stone dressings. The interior walls to be faced with kiln bricks. The roof to be boarded with V-jointed boarding, studded, felted, and covered with tiles. The principals, rafters, and purlins to be of Oregon pine, wrought and framed, and twice varnished with copal varnish. The cost for the erection of the first chapel is estimated at £500. The work

is for the Bexhill Urban District Council, and the scheme was the subject of a competition. Mr. W. H. Alton, of Bexhill, is the architect chosen.

ROYAL INSTITUTE OF BRITISH ARCHITECTS AT GLASGOW.

THE annual dinner of the Royal Institute of British Architects was held on Thursday night in last week at the Windsor Hotel, Glasgow. Mr. William Emerson, president, occupied the chair, and the company numbered about 170. Amongst those at the chairman's table were Mr. J. J. Burnett, president of the Glasgow Institute; the Rev. Professor George Adam Smith, Sir Thomas Drew, Mr. A. Cross, M.P.; the Very Rev. Principal Storr, Sir James Marwick; Mr. John Belcher, A.R.A., Mr. John Slater, and Mr. Thomas E. Collett, vice-presidents of the Association; Mr. John Wilson, M.P. (St. Rollox); Mr. W. R. Copland, chairman of the Glasgow Technical College; Baillie Cleland, Mr. John Muirhead, Edinburgh, and others. The President proposed the loyal toasts, which were pledged with enthusiasm. Mr. John Belcher proposed "The Houses of Parliament," observing that the Houses of Parliament might learn a lesson from Glasgow. The buildings at Glasgow International Exhibition had conducted very much to its financial success, and there were also the great Municipal Buildings. The great city, given over to work and commercial interests, had yet not forgotten art. Glasgow was clever enough to know that art paid as well as gave pleasure. Mr. Cross, who responded, said that they did not nowadays destroy their old monuments nor convert their Pantheons into hospitals. Nor did they make their castles quarries from which to build farm steadings. They had changed all that, and the same spirit would enable them to rise to the occasion in the new buildings they had to erect. He understood that only one of the new public offices at Westminster was to be handed over to H.M. Board of Works. The designs for the other were, he believed, to be entrusted to the son of the late Mr. William Young. He was sure no arrangement could be made which was more likely to succeed. It

should be their aim to see that these great buildings, which would be there practically for all time, were none other than the very best. After the toast of "The Corporation of Glasgow" had been proposed by Mr. John Slater, and responded to by Baillie Cleland, Baillie Shearer gave "The Royal Institute of British Architects and allied Societies." Having reviewed the history of the Institute from its inception, Baillie Shearer said that the architects of Glasgow had played a prominent part in the well-being of the city. In a city like Glasgow, mainly manufacturing and commercial, artistic sense and taste might not be met in all its fulness, but city of toilers as they were, they could point to beautiful spots in their midst, and to buildings worthy of a visit even from the Royal Institute of British Architects. While they had slums still to be uprooted, they had as much civic pride as to desire that their dwellings should be a lovely thing, and not a frightful thing, on the face of the earth. Their architects had taught them that light, airy, and sanitary dwellings for the poorest could be, and should always be, associated with beauty of line and harmony of colour, with grace and dignity. That teaching they would strive to carry out. The President, in responding, said Scotland had always had a prominent place in regard to the arts and culture. Edinburgh, indeed, had been called their modern Athens. Scotland had been largely responsible for the revival of Gothic architecture in the middle of last century, and in the annals of architecture there were the Scottish names of the brothers Adam, Hamilton, Bryce, Young, Bryden, and many others. If the experience of the Institute told them anything, it seemed to point to the fact that there would be undoubtedly great progress in the art of architecture during the coming century, judging from the works of their students, and in this Scotland was very much in the forefront, for a very large proportion of the medals they gave fell to Scottish students. The Art Galleries and the Municipal Buildings showed a considerable advance and progress in the art. The Exhibition buildings, he certainly thought, were, with the exception of the Chicago buildings, the best of the class he had ever seen, and the Chicago Exhibition had unlimited money and the pick of

the interests of Europe at its back. They saw a serious question taking place on such subjects as the housing of the poor among County Council men, members of Parliament, engineers, and others. How often had any of these individuals really proper qualifications to lay down the law on such a subject? It should be the consensus of opinion of a Institute-like theirs, with its allied societies, which should carry the greatest weight, and their views which should be heard most clearly upon such a question. They must, therefore, speak out, and with no thought of selfish ends. Their recommendations must be above suspicion.

Mr. J. J. Burnett, Glasgow, also replied to the toast. The Proceedings concluded with the toast of "The Guests."

BRITISH AND IRISH BUILDING STONES. —XXX—

ABERDEEN.

THE rocks in this county are Old Red Sandstone, Dalriadan altered Sedimentary Strata, Granite 360, 370, 381, 392, 395, 411, 417, 419, 421, 423; Basalt, Diorite, Syenite, Felsite. Aulervien is built on Granite, Gneiss, and a raised beach, Fraserburgh: Schists and Quartzite. Inverurie: Schists, Peterhead Granite, Dalriadan rocks, with intrusive masses of granite, cover eight-ninths of the entire area of the county. Old Red Sandstone is seen along the north coast from Gardenstown to Aberdeen, from here it runs south, past Turfiff to Fyvie, where it dies out, its greatest width being about five miles and its total length about twenty miles. There are several quarries in this district, but the stone raised is for local use only. The Delgatty Quarry Co. work the Turfiff quarry with 14 men. This is the largest sandstone quarry in the north of the county. There is a quarry at Cook, Newbyth, Turfiff, worked by Mr. J. Hadden, who employs only 1 man in it. There is another mass of Old Red Sandstone, found running south from near Huntly to Old Huntly Castle, its total length being about twenty miles, and its greatest width three miles. In this district there are quarries at Rhynie, worked by Mr. W. Cryle, with 29 men; Auchindor, near Rhynie, Mr. A. Donald 11 men; Eldrummy, Mr. A. Wool 6 men; and Kilmarnock, Mr. J. Smith 6 men. The Sandstones, which are used for walling and dressings, are of the same type as those of Herefordshire and Breconshire—viz., micaceous, shales and conglomerates. The north of Scotland Old Red rocks were deposited in a great inland lake, called, for convenience by geologists, Lake Orcadie. The Aberdeen Old Red forms part of this great deposit, which borders the Moray Firth and stretches through Caithness and the Orkneys to the Shetland Islands. Dalriadan rocks, so-called from the ancient Celtic kingdom of Dalriada, are sedimentary, and consist of gneiss, interbedded, and more or less metamorphosed. They consist of gneisses and schists, with quartzites and bands of limestone. None of these are used for dressing, but they are extensively used for field-fencing and rough-walling. The following are the principal quarries. Dalriadan rocks are mostly within a radius of ten miles of Edinburgh: Black of Larg, West Hill, Skene; Red Crags, Dunnet; Den of Portlinton, Bellislie, are worked by the Aberdeen District Committee, Mr. G. Scott, surveyor; and the old and well-known quarries of Dalriada, from which stone is quarried for building, are worked by Mr. W. Dawson, for Baird's trustees. This latter quarry is in the extreme north of the county, not far from New Pittligo. Granite is found in two main masses—one west of Peterhead, and the other west of Aberdeen. There are numerous quarries in the latter, from which stone roughly worked or polished are sent to all parts of the world. Specimens of Aberdeen granite may be seen in many public buildings in London and several provincial towns; in the London cemeteries, where the material is a popular one for monuments, and in the cemetery masses of granite in Easton-road, and other places. The granite may be divided into "red Peterhead" and "grey Aberdeen." The principal quarries are the following:—Grey granite: Kemnay, which gives employment to 386 men, Mr. J. J. Burnett, 100; Dalriada, Mr. A. Grant 10, Ltd.; 210; Scattie, Messrs. A. and F. Manville 119; Persley, Mr. J. Leith 93; Toun Forrest, Kintore, Mr. J. Fyfe 92; Dancing Cairns, Banchory, Messrs. A. and F. Manville 45; Cairnray, Mr. J. Leith 82; Dyce, Kirkhill, Messrs. A. and F. Manville 62; Tillymore, Monymusk, Mr. J. Fyfe 56; Emerald 50; and Clinterty, Newhills, Messrs. Pringle and Slessor; Tyrebugger 39, ditto; Pothill, New Pittligo 19; a soft granite, Mr. W. Davidson; Rora, near Peterhead 18, a blue granite; and Tomnahelich, Cambus O'May, Mr. J. Leith 13. Red Granite: Admiralty, Stirlinghill, Lords Commissioners of Admiralty, Mr. W. Shield, engineer 92; Cornic, Cluny, Mr. J. Fyfe 80; Blackhill, Cruden, Mr. A. Fisher 34; Blackhill, Messrs. Bower and Florence 26; Blackhill, Greenock, Messrs. 416; Porphyry, Basalt, Serpentine, Epidiorite, &c. Campbelltown is built on a raised beach, Old Red Sandstone, Porphyrite, and Crystalline Limestone. Inverury: Quartz rock. Dunoon: Raised Beach and Quartz Schist. The mainland of this county is of very irregular outline, and if divided into four in it were of many different formations a geographical description of them would be next to impossible. Luckily, the whole series may be described as Dalriadan Gneissose schists, quartzites, and slates, with tracts of intrusive porphyrites, and granite. The detached parts of this county consist of several crinoids, the principal being Mull, Islay, Jura, and Tiree, the rocks in all of these being Dalriadan mica and quartz schists, with large areas of intrusive igneous rocks. All the recent rocks are found occupying limited areas on the coast, and are of much interest to the geologist, they are of little or none to the builder. The chalk and greensand are evidently part of the Antrim beds, which were once extensively developed, but are now denuded, except where protected by a Dalriadan slaty rock are used locally for walling, rough quoins, and paving. The finer varieties are quarried for slates at Ballachulish, Ballachulish Slate Quarries Co., Ltd. (380 men); Easdale, Easdale Slate Quarry Co., Ltd. (118); Banchory, Seal Islands, Killin, Messrs. L. and McLean 30; Bredalbaine Island, Islay, Messrs. McLean 70; Benbulbin Island, Easdale, Messrs. McLean and McIntyre 40; Brecklet, Ballachulish, Brecklet Slate Quarries Co., Ltd. (40); Port Mary, Luing Island, Mr. A. Macdonald 10; Glenelg, Kintyre, Messrs. McKechnie and Buchanan 11; Brannavogie, Olan, Messrs. McDougall; and Ardencaple, Islay, the Ardencaple Slate Quarry Co., Olan. Carboniferous limestone is developed in the island of Lismore, the Isles of the Sea, Islay, and other places, but the exposures are not very extensive. The chief quarries are Skene, Campbelltown, Neil Macdonald; Bridgend, Islay, Mr. C. Morrison; Port Ramsay, Lismore, Mr. D. Carmichael; Nalen, Lismore, Mr. J. A. McIntyre; Sheep Island, Port Appin, Mr. D. Carmichael. The following are occasionally worked:—Auchnasheall, Kilmarnock; Barmochend, Taynish; Craighall, Ford and Kintyre; Duntynish; Euroch; and Tombreck, Inverury. None of the limestone quarries on the islands employ more than four men. There are some important granite quarries in this county: that at Tormore in the island of Mull, the stone for the shafts for the Home Yacht, London, many of which are badly cracked; this granite was also used in Westminster Bridge. The largest quarries are Bonaw, Loch Eive, Messrs. Gardiner and Co. 84 men; Furnace, Lochnesside, Messrs. Sin and Co. 92; Ardshod, Ballachulish, The Quarriers Co., Ltd. (63); Ben Cruchan, Loch Awe, Ben Cruchan Granite Co., Ltd. 30; Tormore, Ross of Mull, The Ship Granite and Patent Concrete Co. 30; Craigmore, Taynait, Messrs. Campbell and Co. 10; and Kintalton, Ballachulish, The Quarrier Co., Ltd. 63. The quarry is somewhat of a chert, and is quarried by the channan. Inverury: Hornblende, is worked at Bellanoch by the Caledonian Canal Commissioners. Quartz is quarried at Lagnaha, Ballachulish, by The Quarrier Co., Ltd., and a Serpentine from St. Catherine's Quarry, Inverury, was used in Inverury Castle, and for lining bakers' ovens.

ARGYL.

The rocks here are Lower Chalk, Greensand, Triassic Sandstone passing into Calcareous Grits, Coal Measures, Carboniferous Limestone with much sandstone, Old Red Sandstone, Dalriadan Schistose and Gneissose rocks, &c. 366, 416. Porphyry, Basalt, Serpentine, Epidiorite, &c. Campbelltown is built on a raised beach, Old Red Sandstone, Porphyrite, and Crystalline Limestone. Inverury: Quartz rock. Dunoon: Raised Beach and Quartz Schist. The mainland of this county is of very irregular outline, and if divided into four in it were of many different formations a geographical description of them would be next to impossible. Luckily, the whole series may be described as Dalriadan Gneissose schists, quartzites, and slates, with tracts of intrusive porphyrites, and granite. The detached parts of this county consist of several crinoids, the principal being Mull, Islay, Jura, and Tiree, the rocks in all of these being Dalriadan mica and quartz schists, with large areas of intrusive igneous rocks. All the recent rocks are found occupying limited areas on the coast, and are of much interest to the geologist, they are of little or none to the builder. The chalk and greensand are evidently part of the Antrim beds, which were once extensively developed, but are now denuded, except where protected by a Dalriadan slaty rock are used locally for walling, rough quoins, and paving. The finer varieties are quarried for slates at Ballachulish, Ballachulish Slate Quarries Co., Ltd. (380 men); Easdale, Easdale Slate Quarry Co., Ltd. (118); Banchory, Seal Islands, Killin, Messrs. L. and McLean 30; Bredalbaine Island, Islay, Messrs. McLean 70; Benbulbin Island, Easdale, Messrs. McLean and McIntyre 40; Brecklet, Ballachulish, Brecklet Slate Quarries Co., Ltd. (40); Port Mary, Luing Island, Mr. A. Macdonald 10; Glenelg, Kintyre, Messrs. McKechnie and Buchanan 11; Brannavogie, Olan, Messrs. McDougall; and Ardencaple, Islay, the Ardencaple Slate Quarry Co., Olan. Carboniferous limestone is developed in the island of Lismore, the Isles of the Sea, Islay, and other places, but the exposures are not very extensive. The chief quarries are Skene, Campbelltown, Neil Macdonald; Bridgend, Islay, Mr. C. Morrison; Port Ramsay, Lismore, Mr. D. Carmichael; Nalen, Lismore, Mr. J. A. McIntyre; Sheep Island, Port Appin, Mr. D. Carmichael. The following are occasionally worked:—Auchnasheall, Kilmarnock; Barmochend, Taynish; Craighall, Ford and Kintyre; Duntynish; Euroch; and Tombreck, Inverury. None of the limestone quarries on the islands employ more than four men. There are some important granite quarries in this county: that at Tormore in the island of Mull, the stone for the shafts for the Home Yacht, London, many of which are badly cracked; this granite was also used in Westminster Bridge. The largest quarries are Bonaw, Loch Eive, Messrs. Gardiner and Co. 84 men; Furnace, Lochnesside, Messrs. Sin and Co. 92; Ardshod, Ballachulish, The Quarriers Co., Ltd. (63); Ben Cruchan, Loch Awe, Ben Cruchan Granite Co., Ltd. 30; Tormore, Ross of Mull, The Ship Granite and Patent Concrete Co. 30; Craigmore, Taynait, Messrs. Campbell and Co. 10; and Kintalton, Ballachulish, The Quarrier Co., Ltd. 63. The quarry is somewhat of a chert, and is quarried by the channan. Inverury: Hornblende, is worked at Bellanoch by the Caledonian Canal Commissioners. Quartz is quarried at Lagnaha, Ballachulish, by The Quarrier Co., Ltd., and a Serpentine from St. Catherine's Quarry, Inverury, was used in Inverury Castle, and for lining bakers' ovens.

There are several Whinstone quarries in the county this stone being used for rough walling and road metalling, which give employment to more than four men.

AVONSHIRE.

The rocks in this county are Permian Sandstone (355, 405), Coal Measures 385, Millstone Grit 385, Silurian Limestone, Calcareous Limestone, Old Red Sandstone 385, Silurian Bed, Granite, Basalt, Porphyrite, Felsite, Serpentine, Syenite, Diorite. Ayr is built on Alluvium and Coal Measures. Ardross: Raised Beach, Calcareous Sandstone, which is overlaid by a thick bed of sandstone, Old Red Sandstone, Kirkcaldy, Upper Carboniferous Beds (Sandstone, Coal, and Iron). Mauchline: Permian Sandstone, Porphyrite. The whole centre of the county is occupied by Coal Measures, in the middle of which is a large tract of Permian Sandstone, margined by Porphyrite. The Coal Measures are encircled by Carboniferous Limestone, and the latter is bounded by intrusive porphyritic rocks. The Permian Sandstones are found west and south of Mauchline, the principal quarries in them being Dalriadan Limestone, Mr. J. Baird 170 men; and Burskington, Messrs. Baird and Stevenson (65). Coal Measures Sandstone is quarried at Monkredald, Kilwinning, Messrs. Baird and Stevenson 43; Lylestone, Kilwinning Lylestone Quarry Co., Ltd. 27; Seven Acres, Kilwinning, Messrs. Mauchline and Baird 12; Stevenson 12; and Craikland, Dundonald, Messrs. Kilpatrick, 9. Calcareous Sandstone is quarried at Swinridgmain, Dalry, Mr. W. Boyd 9; and White Spot, Dalry, Messrs. Fulton and Longmuir 15. Fireclay is worked in the carboniferous rocks at Bankfoot, Kirkcaldy, Messrs. Baird and Co. 7, and at Lylestone. The chief quarries in the Carboniferous Limestone are Crawford, Beith, Mr. A. Speir 12; Tomteith, Fimmore, Mr. J. Mitchell 11; Dockra, Barrnill, Mr. R. Anderson 9; Craighead, Dalry, Mr. J. McMorland 4; Old Red Sandstone runs from near Dalrymple to the coast at Girvan, passing Kirkcaldy and Kirkcaldy. On the south and east of this county Silurian rocks of Llandoil and Caradoc also are found, their western boundary being marked by lower (Mr. J. Baird 170 men), which runs in a straight but broken line from Carrick to East Lanan. These rocks furnish a great variety of building stones for rough walling, and in the best buildings Permian Sandstones are used for quoins, sills, and other dressings. These latter, when not quarried in the county, have quarries at Tinkinhill Sorn, Mr. C. Kay, and Ailsa Craig, Girvan, Messrs. Girvan. Neither is in constant work, and the hands employed seldom exceed three or four. The clays of the Coal Measures are worked at Kilmarnock, Kilwinning, and other places for brick-making. The Carboniferous rocks at Stevenson, Saltcoats, was at one time sent to Dublin and Belfast for dressed work. The celebrated "water of Ayr" stones, which are exported to all parts of the world for sharpening steel tools, belong to the Lower Carboniferous, and are a soft, close-grained, something like clay slate. A brecciated sandstone quarried in the Millstone Grit at Kame Hill, Fairlie, were much used for millstones. The Carboniferous Limestone is quarried for agricultural as well as building purposes.

The new Primitive Methodist chapel and school at Harrogate have been completed at a cost of £19,000, and in the York first circuit of the same denomination, new meetings are being commenced, at an estimated outlay of £5,000.

The foundation-stone of a National school at St. Anthony's, Newcastle, was laid last week. The building will comprise a schoolroom, 100 ft. long by 40 ft. wide, with a sliding screen and class-rooms. A second room will be devoted to cooking, and there will be cloakrooms, scullery, &c. The school will accommodate about 100 scholars. The playground will be about 100 square yards in extent, will be asphalted. The architect is Mr. W. S. Anderson, of Hunter's road, Newcastle, and the builder is Mr. J. Wightman Douglas, of Alnwick.

OBITUARY.

We regret to announce the decease of the last survivor of the school of architects who carried out the Revival of Gothic architecture. Mr. JAMES BROOKS, Past Vice-President R.I.B.A., of Wellington-street, Strand, who passed away in his sleep early on Monday morning last, at his residence, The Grange, Park-Lane, Stoke Newington, aged 76 years. Mr. Brooks, who had long been in failing health, and practically retired from practice in July last, succumbed to failure of the heart. Born in 1825 at Abingdon, Mr. Brooks had, as he expressed it on one occasion in our columns, a "tumble-down house" and came to London at an early age. He went as a pupil to the late Mr. Frank Cross, and afterwards entered the office of the late Lewis Stode, F.R.I.B.A. He was a diligent student at the Royal Academy and in the late Professor Donaldson's architectural class at University College, and a plodding teller in the office. In 1852 he commenced practice for himself—at first in a comparatively humble way, his earliest commission being for a house and shop at Wantage, and the next for a large house near that town. In 1863 Mr. Brooks came to the front with a design for St. Michael's, Shore-ditch, which was executed in brick, with a few touches of the coloured bands and diaper then so popular; and, when erected, its original planning and inexpensive treatment attracted widespread attention. Other early and admirably proportioned churches were St. Andrew's, Plaistow, which was shown in our pages 38, 40, and 16, and St. John's, 25, 1870. In the central tower, modelled on that of St. Albion at Angers, was never carried out—St. Chad's, Haggerston, illustrated by us on Sept. 9, 1870. These cheap, but well planned and dignified, edifices led to the placing in Mr. Brooks's hands of many subsequent commissions for churches, and a few more clever schemes were put forward for erection were never raised by the too-sanguine promoters. St. Columba's Church, Kingsland-road, Haggerston, reproduced in our issue of Jan. 19, 1872, and Dec. 28, 1873, was conceived, like many of Street's and Pearson's churches of that era, in a taking phase of Early French style, and was one of the first to succeed in avoiding the obstruction of sight by piers or columns by the expedient of reducing the aisles to narrow passages—a device carried out with a dignity and sense of proportion which many of those failed to achieve who also relegated the nave arcades into close proximity to the outer north and south walls. Many of Mr. Brooks's churches were grained with brickwork, and although now and then the poverty of the promoters led to a certain crudity and harshness of effect, due to cutting down the estimates, many of these edifices were very successful. Among those works of recollection and study may be enumerated St. John the Baptist, Holland Park, Kensington, shown by us from Mr. Brooks's drawings, Nov. 29, 1872, and April 4, 1873;—the central tower has been abandoned, but otherwise this great church, with its very lofty reredos and richly-carved screen and pinnacles of stone, is complete with the exception of a projecting timber-gate portal, to be enriched with tiers of sculpture and turrets, the whole designed on 13th-century French lines, recalling Chartres Cathedral. Then there are also St. Mary at the Cross, Shore-ditch, reproduced by us on Dec. 5, 1872, and 12, 1873; All Saints, Perry's-Parade, Nov. 13, 1874; the Church of Annunciation, Priek End, Chislehurst, given by Jan. 29, 1875—a building completed a few years since by Mr. Somers Clarke, F.S.A., Mr. Brooks having thrown up the commission owing to disputes with the vicar, long since deceased; and an office "chick" shut in by high buildings, and therefore chiefly top-lighted—see illustration May 26, 1882, St. Peter's, St. Leonard's-on-Sea, is a striking edifice, having a lofty central niche and no tower; it appeared in the BUILDING NEWS for Jan. 20, 1883. Other edifices, several of which we have illustrated in our columns, are St. Andrew's, Willenden; All Hallows' (originally the Church of the Gospel Oak; the completion of St. Faith's, Stoke Newington, begun by the late William Burgess, A.R.A.; St. Mary of Nazareth and Convent-house, Edgware (a branch of St. Cross, Shore-ditch). Among the more recent

churches are SS. Peter and Paul, Charlton, near Dover, built in 1891; a new church to Sir Gilbert Scott's early Church of Christ, Turnham-green; the new parish church of St. Mary, Torsey (now completed with the exception of the upper portion of the tower); and St. Peter's, district church, in Wightman-road, close by; and Holy Innocents, Hammersmith, the nave of which building has just been conserved. Mr. Brooks carried out many valuable church restorations, including those of Weth, near Wether, and Mysey Hampton, and built many many parsonages, rectories, houses, and breweries. Among his recent works abroad was a large mansion at Rondebosch, Cape Town, close to Mr. Cecil Rhodes's house. One of the very few competitions into which he entered was the abortive one for Liverpool Cathedral, profusely illustrated by us by plan and elevation and perspective on Jan. 15 and 29, Feb. 12 and 19, 1886. It was Late Thirteenth Century in style, with features adopted from Chartres and Salamanca cathedrals, and showed a central lantern and wide and lofty aisled nave with galleries over aisles, above which were a tall triforium and clerestory. Personally we preferred to have seen other two designs by Mr. Emerson and Messrs. Bodley and Garner, but all have alike passed into the limbo of neglect and oblivion; certainly it was not equal to any of Mr. Brooks's later designs. Mr. Brooks was, at the time of his death, one of the senior members of the Institution of British Architects, having been elected as a Fellow in 1866; he served on the council for many years and read several papers at its meetings, and was vice-president from 1892 to 1896. He was awarded the Royal Gold Medal in 1895, a well-merited presentation which attracted the notice of the profession from the fact that in the previous year the Institute Council passed over their colleague in favour of Lord Leighton, P.R.A. Mr. Brooks was thrice married, and survived by his widow, three sons, and a daughter. For the past five years he had been in partnership with his eldest son, Mr. James Martin Brooks, who, in 1894, they were joined by Mr. G. H. Gosnell, F.S.I., of Hereford; the surviving partners are carrying on the practice in London and Hereford. The funeral service took place at St. Faith's Church, Stoke Newington, yesterday (Thursday) morning, the interment following at Cooney Hatch Cemetery.

MR. WILLIAM WATSON, architect, of Wakefield, died on the 3rd inst. at his residence, The Grange, 60, City Road, aged 60 years. He had carried out many business premises and much church work in Wakefield and the vicinity.

The Marquis of Northampton formally opened, on Tuesday, the new buildings of the Young Men's Christian Association, Burton-on-Trent. They extend from High-street back to Friar's-walk, a distance of fifty yards, where there is another frontage. The buildings include a gymnasium and lecture-hall. The cost of construction has been £13,000.

The Holbeach-road Board Schools, Catford, were publicly opened by Mr. Lyulph Stanley (Chairman of the London School Board) on Wednesday evening. The school provides accommodation in a pleasantly airy district for 314 boys, 314 girls, and 38 infants.

A public hall, erected for the town of Jedburgh and district, was formally opened on Tuesday. The total destruction of the Corn Exchange by fire three years ago deprived the community of the usual place for public meetings and entertainment, and the town council made use of their statutory powers to provide a hall and other accommodation. The new building is situated in Abbey-place, and has cost £6,000. Besides the large hall and gallery, in which about 800 people can be accommodated, there are a small hall for meetings, a drill-hall and armoury for Volunteers, ante-rooms, cloak-rooms, and other places. The principal frontage is 90 ft. in length. The style is an adaptation of the Later Renaissance period. Mr. James P. Alison, of Hawick, was the architect.

The partnership hitherto existing between Christopher O. Ellison and W. S. Ellison, architects, of London, under the style of C. O. Ellison and Son, has been dissolved.

The Board of Trade have, after modification, confirmed an order made by the Light Railway Commissioners and entitled the Bury and Diss Light Railway Order, 1901, authorising the construction of a light railway in the counties of Norfolk and Suffolk from Bury St. Edmunds to Stanton, Walsham-le-Willows, South Lopham, and Diss.

COMPETITIONS.

STOCKPORT.—Plans were recently obtained by competition of a new workhouse infirmary proposed to be erected for the Stockport Union on a site purchased many years ago by the board of guardians for the erection of a workhouse. Last week the New Infirmary Committee considered the report of Mr. Thomas Worthington, architect, of Manchester, who had been appointed as assessor to examine the seventeen sets of plans sent in and award the premiums offered, when it was decided by a majority not to accept for the present any of the three premiated plans, on the ground that the best limit in the instructions to competitors had been exceeded. At a largely-attended meeting of the board on Monday, Mr. F. R. Morley pointed out that the guardians asked for plans showing an infirmary of 322 beds at an estimated cost not exceeding £180 per bed. The estimates for the three sets of plans selected by the assessor were as follows:—No. 1, £14,422, or £160 per bed; No. 2, £17,322, or £147 per bed; No. 3, £58,272, or £180 per bed. A majority of the committee considered that to accept one of these three sets of plans without a further report upon the remaining fourteen sets would be an acquiescence in the unauthorised expenditure which, greater within the limit of cost of £130 per bed. The chairman suggested that the guardians should first decide whether they intended to follow up the resolution of the former board and build at Stepping Hill, or whether they meant to provide increased hospital accommodation on the site of the present workhouse. Shaw Heath. An animated discussion resulted in a decision to suspend operations as to a new infirmary until the opinion of the guardians on the question of site has been expressed.

CHIPS.

The Bishop of Oxford (Dr. Paget) visited High Wycombe on Wednesday for the purpose of laying the foundation-stone of the new district church of St. John, the building of which is part of a large scheme of church extension, rendered necessary by the rapidly increasing population.

The private view of the seventh exhibition of sketches by members of the London Sketch Club will be held on Saturday, the 12th inst., at the Modern Gallery, 175, Bond-street, W., and the exhibition will be open to the public from the 14th to the 20th inst. inclusive.

Work has been commenced on the buildings for the St. Anne's College, Manchester, in place of the present inadequate premises. The buildings provide fifty beds, principals' and teachers' quarters, school and classrooms, gymnasium, and a large dining-hall, and are a Free College style of architecture, faced with Accrington red bricks and Doulton's buff terracotta dressings. The architect is Mr. Chas. A. Hindle, A.R.I.B.A., of 11, Bridge-street, Manchester, and the contractors are Messrs. J. Shepherd and Sons, of St. Anne's, Manchester.

The Chancellor Memorial Church, College-street South, Belfast, which has been erected in memory of the late Rev. Professor Chancellor, D.D., was opened for public worship last week. The church has been built on the site of the old church, in which Dr. Chancellor ministered for 30 years, and it contains a mural tablet to that divine.

At a rough estimate, the number of tenements which will be connected with the underground sewerage system on the completion of the Melbourne and Metropolitan Board of Works, is taking in what is known as the metropolitan sewerage area, will aggregate 100,000. Of that total 39,365 tenements have been connected with the sewers, the work of connection being carried out in 29,619 houses by private property owners, and in 18,746 cases by the board's workmen. The amounts in the latter case have just been reduced, and have involved a total cost of £202,987.

In Dewlish Church, near Dorchester, on Wednesday week, memorial services were held for Montmorency, and his aunt, Mrs. Beckett, were dedicated. The memorial to Captain De Montmorency consists of a two-light stained-glass window erected by the officers, past and present, of his old regiment, the 21st Lancers, and the memorial to Mrs. Beckett is an organ.

A three-light stained-glass window has been dedicated in South Elkington parish church. It represents Christ the Consolator, and has been executed by Messrs. Ward and Hughes, of Frinton, Essex, Sole.

The names of Mr. Herbert Davison Robinson, timber merchant, Temple, East Kilpatrick, and of Alexander Weir, fireproof manufacturer, Castley House, Cumbernauld, have been added to the commission of the peace for Dumfriesshire.

Building Intelligence.

BIRMINGHAM.—The Duke of Norfolk has contributed a further sum of £4,000, making £5,000 in all, towards the scheme which the Fathers of the Oratory of St. Philip Neri, who inaugurated by erecting a suitable memorial to the late Cardinal Newman. It is proposed to erect on the site of the present Oratory Church at Birmingham a building worthy of the Order and of the eminent ecclesiastic who did so much to promote the reputation of the oratory. The cost of the scheme is estimated at £23,000, towards which about £8,000 has already been subscribed. Mr. E. Doran Webb, F.S.A., has been intrusted with the preparation of the plans, which comprise a tower, having to the right a Lady-chapel and a chapel to St. Philip Neri, and around the church will be smaller chapels and altars dedicated to St. Joseph, St. Valentine the Blessed, Juvenal, and Sebastian; also a chapel of the Sacred Heart. The high altar, which was recently presented to the Oratory Fathers, will be a notable feature of the new building.

EDINBURGH.—Several improvements have been carried out during the vacation at the Merchant Company School at Edinburgh. In addition, the drainage system of Daniel Stewart's College was overhauled, and at the same institution a safety rifle-shooting range is in course of preparation. Improved and enlarged accommodation has been secured at George Watson's College for Boys for science teaching. The new building at the College has been raised, and by that means a suite of rooms has been obtained, which are being fitted up. The cost of the additions and alterations here will be about £4,000. Science teaching is also to be inaugurated in the coming session at the Queen's-school and George-square Ladies' Colleges, and at both institutions laboratories on a limited scale have been fitted up. Messrs. McEibson and Ross, of Edinburgh, were the architects for the alterations at George Watson's Boys' College, and the whole of the structural work done in the course of the vacation was supervised by Mr. James A. Kennedy, superintendent of works.

GOVAN.—The completion of the largest of the building schemes which the town council have on hand—namely, the municipal buildings—was celebrated on Friday night. The buildings, which have been erected at a cost of £18,000, occupy a complete square of 157 ft. by 200 ft., and are bounded by Meryland-street, Govan-road, Summertown-road, and Carmichael-street. In outward appearance the buildings are a somewhat Free Treatment of Classical architecture. Medallion portraits of Provost Kirkwood and Bailie Muir, the former of whom is placed on either side of the entrance to the council chambers in Govan-road. The large hall, with its three galleries, accommodates about 2,500 persons. The block also contains offices for nearly all the administrative work of the burgh. The architects are Messrs. Thomson and Smith, 101, West George-street, Glasgow, whose design, selected in competition, was illustrated in the BUILDING NEWS for May 21, 1897.

LEEDS.—For thirty-three tenement houses now approaching completion off Duke-street, in the York-street insanitary area, Leeds, there have already been over fifty applicants. Thirteen have been accepted, and sufficient houses for other houses will doubtless be obtained before the end of the month, by which time they are expected to be in a fit condition for occupation. Room-farming will be strictly prohibited. Built of brick with terra-cotta facings, the structure consists of three floors, with a basement, in front of the second and third floors. Each house has a living room 12 ft. square, fitted with a good cooking-range, cupboards, and other requisites to be found in a modern artisan's dwelling. In eighteen of the tenements there is one bedroom, the same size as the living room; in the other twenty-one there are two bedrooms. Being through houses there are doors both back and front, and behind the building is a large common yard suitable for drying clothes. The object of the undertaking is to supply homes to a few of the people displaced by the recent demolition of property in the York-street area. The rent of houses with two bedrooms is 5s. 3d. a week clear of the rates, and of the smaller dwellings 4s. 3d. a week inclusive. Though belonging to a private individual—Mr. Robert Wood—the block has been put up in accordance with plans approved by the Local

Government Board, a strict adherence to such plans being one of the conditions of sale to him by the Corporation. Many of the tenants of the old slum property obtained shelter of a kind for at least a week, but neither obedience to laws of health, nor to regulations of decency, were possible in such hovels.

ST. PASCAS. The new Public Baths and Washhouses in Prince of Wales-road, Kentish Town, were opened on Wednesday afternoon by Sir J. Blundell Maple, Bart., M.P. The institution, described by Sir Blundell, who has some of the most extensive knowledge of furniture, as "the finest and most beautiful washhouse I have ever seen," comprises four swimming baths, 130 slipper baths, and a public washhouse fitted up for fifty women. The entrances are kept separate, that for men being in Prince of Wales-road, and that for women in Gratton-road, and these are again subdivided into first and second class, with pay-box between them in each case. The men's first-class swimming bath has a pond 100 ft. by 35 ft.; it is provided with a gallery on all four sides, and can therefore be used in winter for outdoor purposes; it is warmed and ventilated on the plenum system. The men's second-class swimming bath has also a pond of 100 ft. by 35 ft. in area; each bath is 11 ft. long by 50 ft. in width, and the ceilings are designed upon a novel plan. Instead of being plain, the ceiling of the bath has a centre, there is a curved ceiling, trefoil-shaped, in section, with curved glazed inner sashes, the central portion being pierced with grids for ventilation and shower-bath purposes. By this means the acoustic properties of the hall are vastly improved, and a better architectural effect is obtained. A refreshment-room is provided common to both these baths. The ladies' first-class swimming bath has a pond 75 ft. by 25 ft., while their second-class bath is 50 ft. by 20 ft. only. The 130 slipper baths on the first floor are of glazed fireclay, and are in rising partitions of slate—canalised in the first class, and tiled in the second-class. In the washing department are fifty compartments, and also a crèche. The establishment laundry is located in the basement, and is directly lighted. In the boiler-house are three Lancashire boilers, 30 ft. by 7 ft. 6 in. The buildings are lighted on electricity, supplied from the public mains. The elevations are all faced with Laurence's red bricks, with terra-cotta bands and dressings, and the construction is fireproof throughout. The internal walls are lined with glazed bricks, and the floors of the swimming baths are paved with terrazzo. For the decoration of the interior painting Ripolin has been used, at an estimated saving of at least £150 on the employment of ordinary paint. The architect is Mr. Thomas W. Aldwinckle, F.R.I.B.A., whose design was selected in a limited competition, and was illustrated in the BUILDING NEWS for Nov. 8, 1899. The builder is Mr. Charles Wall, of Lots-road, Chelsea. The chief engineering works have been carried out by Messrs. Z. D. Berry and Sons. The hydraulic power plant and ventilation have been carried out by Messrs. W. J. Fraser and Co. The electric lighting has been carried out by Messrs. Edmundson. Messrs. Doulton and Co. executed the terra-cotta work; Messrs. W. B. Simpson and Sons, the furnace work; Messrs. W. J. Fraser and Co., the tile work. All skylights are laid with Rendle's patent glazing. The glazed fireclay baths were supplied by the Farney Iron Company. The internal sanitary fittings have been supplied by Messrs. Tyler and Sons. The wood-block flooring was supplied by the Westminster Flooring Company. The enamelled plate partitions and other slate-roof work, together with all roof-slating, was executed by Messrs. Shenton and Co. Mr. Aldwinckle had the assistance of Messrs. Dolby and Williamson, as consulting engineers, in connection with the electric lighting. Mr. E. T. Larkin has acted as clerk of the works throughout. The cost has been £75,000.

STOW LONGA. The ancient church of St. Botolph, Stow Longa, Hants, was reopened on October 2, after the rebuilding of the clerestory and erection of new roofs to the nave and aisles, from the designs of Messrs. John and S. Skipper, architects, 7, Abchurch-lane, London, E.C. 4. The church dates from late Norman times, and has a fine priest's door with carved tympanum; the nave arcades are Early English, and the aisles are chiefly of Late Decorated date; while the fine west tower and the windows of the

chancel are Early Perpendicular. No sufficient evidence of the form of the old roof remained. For the new work, it was determined to retain the steeper pitch which the 17th-century roof had, and to reuse the old tiles, thus preserving some memory of the last ancient chapel has again been fitted up with an altar for use as a morning chapel, and here the roof is ceiled with oak boarding having moulded ribs and carved bosses. Weldon stone has been used throughout. The whole of the timber is English oak. Messrs. Wraycroft and Sons, of New St., being the contractors for the carpenter's work. The total cost of the work has been £1,150. The work practically completes the restoration of the church, extending over twenty-five years, and due to the exertions of the Rev. G. E. Sharland.

CHIPS.

The monument erected to the memory of the Russian soldiers who died at the battle of Bender, which an Anglo-Russian force under the Duke of York was defeated by the French on September 19, 1739, was unveiled recently. The site for the monument was given by the Russian Government by the Van Reenen family.

The town council of Folkestone have appointed a committee to consider a comprehensive scheme of improvements, which comprise the acquisition of land and foreshore for the purpose of extending the Marine Gardens, the extension of the sewer outfall to Copt Point, and the provision of a recreation-ground on East Cliff.

At the half-yearly meeting of the shareholders of the Mersey Railway Company, Mr. James Falconer, chairman of the directors, said it was absolutely necessary for the success of the undertaking that a change should be made from steam to electric traction; and the directors had entered into a contract with the British Westinghouse Electric Company to find the necessary capital and carry out the work of conversion. In the discussion which followed, Mr. Charles Birchall severely criticised the policy of the directors, and contended that the Marine Gardens, the extension of the sewer outfall, and the provision of a recreation-ground, were eventually adopted.

Mr. Robert Bayly, J.P., of Torr-grove, Weston Ferrville, Devon, who was Lord of the Manor of Shroton, in the parish of St. Ann, R. A. Bayly, Plymouth, timber merchants, and who died on July 18 last, aged 62 years, left personal estate of the net value of £348,377 2s. 1d., the gross value being £446,145 8s. 8d.

Memorial-stones for the Lawson Temperance Hall, which is now being built at Lincoln, at a cost of about £6,500, were laid last week. The building will be of red brick with stone dressings, and the front will be lighted by four arched windows. A large hall to be provided capable of seating 1,000 persons, a lecture-hall, a workmen's café, reading and recreation rooms, lodge-rooms, &c.

At St. Peter's Presbyterian Church, Sunderland, on Sunday, a memorial stained-glass window was dedicated. The subject is "Christ appearing to Mary Magdalene," and the work is by Mr. R. A. Bayly, Plymouth, timber merchants, and who died on July 18 last, aged 62 years, left personal estate of the net value of £348,377 2s. 1d., the gross value being £446,145 8s. 8d.

Sanction has been obtained by the urban district council for Harrow for three loans for local improvements—viz., £8,700 for works of sewerage, £1,000 for public baths, and £800 for widening of East-road. Application will shortly be made for sanction to a loan of £12,900 for the improvement of the public footpaths.

Mr. E. L. Masqueray, of New York, has been appointed by Chief Architect Taylor to act as expert for the Louisiana Purchase Exposition at St. Louis. He was born forty years ago in France, where he studied and practised until he came to New York, at the age of 27 years, and for the last nine years has conducted a French atelier in New York for the study of architecture.

A 24d. pamphlet has been published as No. 516 of the "Miscellaneous Series" of Diplomatic and Consular Reports issued by our Foreign Office, dealing with the question of "Wages in Germany." It contains the average age of pupils at the Royal Building Trades Technical Schools at Stuttgart as high as twenty years, and it gives particulars of the excellent all-round training which many of the best skilled workmen begin to specialise in this particular industry. The little State of Wurtemberg gives a subvention of close upon £50,000 a year to the University of Tübingen alone.

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ILLUSTRATIONS.

DAVID LEWIS WORKMEN'S HOME, LIVERPOOL.—MURGLEY HOUSE.—ST. MARTIN'S CHURCH, DOVER.—GARDEN SHELTER AT BIDEHAM.—SUMNER HOUSE, DALHAM HALL.—A GARDENER'S BOTHY.—OF CEMETERY CHAPEL, BEXHILL.

Our Illustrations.

THE DAVID LEWIS WORKMEN'S HOME AND CLUB, LIVERPOOL.

The accompanying plate represents a pile of buildings being erected in Liverpool by Mr. B. W. Levy out of the moneys of the David Lewis Trust Funds. The object is the provision of a workman's home and club and public hall, somewhat on the lines of the People's Palace in London. No grander site could have been selected in Liverpool than the one chosen—namely, the land upon which old St. James's Market stood, and which has its main frontage in Great George-place, its side frontage to Nile-street, and its back in Rathbone-street. The institution will be the means of not only giving a helping hand to the working men who avail themselves of its privileges, but of raising the social status of all who patronise it. The advantages it will offer are of a manifold character, comprising clean and wholesome boarding-house accommodation at a low rate, a social club, reading and billiard-rooms, facilities for educational improvement, physical development, and so forth. The cost, it is stated, will be £100,000, including site, buildings and furnishing. Mr. J. Francis Doyle is the architect from whose designs and under whose superintendence this large building is to be erected. The main frontage in Great George-place will extend to 174ft. The side frontage in Nile-street will have a length of 146ft. The site embraces 220ft. by 176ft., and the buildings will be set back from the boundary some 21ft.—an arrangement which must enhance the appearance. The external architecture may be called a free adaptation of Renaissance. The materials used in the facing of the main outer walls will be a special brick and terracotta, with green slates on the roof. The main entrance to the public hall and reading-room will be in Great George-place, and will be 12ft. wide and have a spacious hall, 50ft. by 20ft., arched and finished in tiles and faience. In regard to the public hall, which will be 90ft. by 22ft. and 35ft. high, it may be explained that this will supply being wanted in the centre of the building, and will accommodate upwards of 800 persons. It will be complete with stage, separate stage entrance from Rathbone-street, stage boxes, gallery, and green-rooms for both sexes. There will be special and ample means of exit, provision being made for no fewer than eleven sources of egress. All the staircases and floors will be fireproof. Respecting the Social Club, it is arranged that this shall consist of a number of large rooms—a billiard-room, 67ft. by 30ft.; two committee-rooms, three social clubrooms, each 50ft. by 26ft., and a billiard-room, 50ft. by 26ft., and also a special clubroom and toilet facilities for females. To the south of the clubroom, on the same site, ample space is left open for the subsequent erection of a gymnasium 132ft. by 54ft. Relative to the scheme for including a workman's home, it

is seen that special attention has been paid to this department. The home, which, of course, will be part and parcel of the one block of buildings and under the same roof, will be approached and entered from Nile-street, off Great George-street, through turnstiles. Just over the threshold the visitor will find himself at the office, and adjacent to this will be the master's house, the quarters assigned to the superintendent in the north-east corner of the building will be commodious and conveniently placed. The halls and corridors will be very spacious, the fireproof main staircase being 21ft. square, with a hall 11ft. by 20ft. The reading-room will be 50ft. by 20ft. In the central position will be the dining-room and the dining-room, with an area of 20ft. by 15ft., will be the provision-shop. There will be lifts connecting the shop with the kitchens in the basement. The dining-room, 80ft. by 41ft., will be a splendidly-appointed place. It will contain two kitchen fireplaces and a special cooking fire with a lodgers' scullery, and every appliance which can confer for comfort and cleanliness. The kitchens, sculleries, pantries, and stores will be in the basement. The basement will be on the level of the seven-yard area, and will thus for all practical purposes be as light as the ground floor above. The dining-room and stores will also be numerous lockers and storerooms for the accommodation of the things belonging to the boarders at the Home. On the upper floors, approached from the large main staircase by three independent gangways, will be the sleeping cubicles. These will be arranged in groups for easy working and control, and will also be two other stone staircases for exit in cases of necessity. In view of any possible outbreak of flames, all the floors and staircases will be fireproof, and, besides that precautionary provision, there will be special appliances for the extinguishing of fire. The number of cubicles for easy working and control, and the design is 381. Over the billiard-room will be a large flat roof, which it is intended shall be for the use of the men who sleep in the home, and who will thus be offered an opportunity of getting fresh air under the most delightful conditions. The club will not only be for the use of the boarders domiciled within the home, but also for under certain conditions the inhabitants of the locality will be able to avail themselves of its privileges. According to present intentions, a charge of sixpence each per night will be made to occupants of the sleeping cubicles, who, in addition to the lodging accommodation, will subject to good behaviour, be entitled to the advantages of the club. The heating, ventilating, and electric-lighting arrangements are of the most modern and efficient description. The work of erection, which has already been begun, has been entrusted to Mr. Isaac Dilworth, the clerk of the works for which Mr. W. Gillins, architect, the building has been commenced, Mr. Levy has generously authorised a further expenditure, by which means the architect will be able to considerably improve and enrich the details of the elevations and the work generally. We propose to illustrate the plans next week.

MURGLEY HOUSE, NEAR STAMFORD.

This sheet of Silver Medal competition drawings from the R.I.B.A. was the one chosen to be exhibited in the provinces this year, with the designs of Mr. W. Gillins, architect, in the street. It formed part of the set of measured plans and details prepared by Mr. H. F. Traylen, of Stamford, in illustration of Burleigh House, the residence of the Marquis of Exeter. For this series of drawings a medal of merit was awarded. In the BUILDING NEWS for June 28 last we published Mr. Traylen's description of the mansion at the time we gave his plans and elevations. The accompanying detail to-day shows the famous entrance tower in the central court. The spire is 115ft. high from ground to vane. The scale is drawn on the plate, and the more important dimensions are figured in.

ST. MARTIN'S CHURCH, DOVER.

This brick-built church, shown by the accompanying plans and plans, has been some time modified in execution. The fall of the site has enabled the architects to contrive a Sunday-school room and a parish room under the east end of the nave, and below the choir. A stairway connects the former room with the church. The baptistry is treated as a semi-octagonal chapel, with a central position in the nave, and a semi-circle of three bays. Messrs. Jennings and Dutoit, of Dover, are the architects.

GARDEN SHELTER AT BIDEHAM.

This drawing illustrates a portion of a garden design planned with a new house recently erected at Bideham, near Bedford, a perspective of which was recently published in our pages. The Lily pond and shelter, as shown, was intended to be placed between the tennis lawn on one side, and the kitchen garden on the other; the arched openings in the yew hedges are the entrances to those parts. The architects are Messrs. C. F. Mallow and Grocock, of Gray's In-square, W.C., and Bedford.

SUMMER HOUSE, DALHAM HALL.

This illustration shows a portion of a complete scheme for remodelling the gardens at above, as shown by a drawing which was in this year's Exhibition of the Royal Academy. The materials used are local stone and red bricks. The roofs are covered in copper. The architects are Mr. T. H. Mason (the well-known garden architect) and Messrs. C. F. Mallow and Grocock, of Gray's In-square, W.C., and Bedford. We shall illustrate the general view of the whole scheme shortly.

GARDENERS' BOTHY, ETC., KING'S WALDEN, HERTS.

This is one of a group of buildings which have been erected close to one of the entrance-gates of the mansion known as "The Bury," the property of Mr. T. F. Harrison. It comprises head gardener's cottage, gardeners' botby, with fruit-rooms over, and engine, dynamo, and accumulator rooms, and a coal-shed. The fittings to the external walls are of local red bricks, with Broselyte tile roofs. The general contractor was Mr. Wm. Adcock, of Dover, who also built the mansion, &c. The electric-lighting plant is of sufficient capacity to light the mansion, stables, church, &c. The architects were Messrs. Beeson and Burnstorf, of Lincoln's Inn-fields, London.

SELECTED DESIGN FOR CEMETERY CHAPEL, BEXHILL, SUSSEX.

For description and sketch plan of Mr. W. H. Altou's selected design see page 181.

CHIPS.

The Stourbridge Urban District Council decided on Monday to raise the salary of their surveyor, Mr. F. Woodward, by £50 a year.

To the Baptist Chapel in Unthank-road, Norwich, Sunday-schools have just been added from the designs of Mr. A. F. Scott, of that city, the contractor being Mr. S. R. W. Walker. The building consists of a central hall with gallery, nine classrooms, and a room for the superintendent, and it is connected with the church by a covered corridor. The cost of the building has been £1,800.

The Yorkshire College at Leeds, built from the designs of Messrs. W. and J. G. and Sons, has just been enlarged by the erection of a one-story electrical department, consisting of electric-motor room, electrical cable jointing room, and workshop. A new metalliferous and coal-mining department is to be added at a further cost of £7,000.

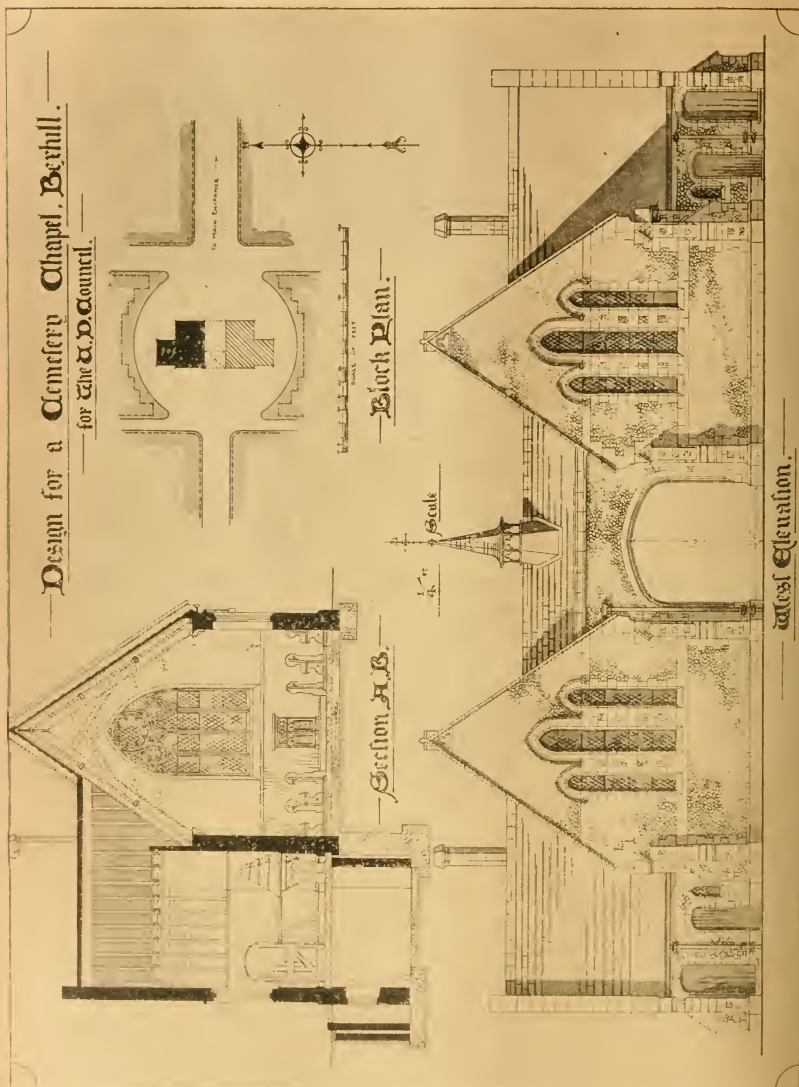
The City Council of Gloucester have resolved to apply to the Local Government Board for sanction to borrow some £13,500, the principal items being £5,820 for waterworks, £4,980 for the hospital, and £1,335 costs of city extension.

New sewer outlet works are being undertaken at Lytham by Mr. John B. Blackpool, whose contract was between £3,000 and £4,000. A refuse destructor is in course of building for the same local authority by Messrs. Meldrum, of Manchester.

At a recent meeting of the rural district council for Tavistock, Mr. Mason, their sanitary inspector, reported that he had conducted the Bere Alston drainage scheme at a total cost of £1,314. The Medical Officer of Health (Dr. C. C. Brodric) said great credit was due to Mr. Mason for the efficient way he had carried out the work. Mr. Bellamy, C.E., of Plymouth, the engineer, stated that he had also inspected the work, and found it most satisfactory, better than any contractor could have been expected to do it.

The foundation-stone of a new mission church at St. Suint was laid at Blackham, near Wrytham, Sussex, last week. The walls of the new edifice are being constructed of local stone from the Hackenden Quarries, at East Grinstead, with dressings of Bath stone. The style is Early English, and the church will consist of a chancel, with a stone bell-turret at the west end. It will have a five-light east window, and will hold nearly 200 persons. The architect is Mr. Lacy W. Ridge, F.R.I.B.A., and the builder Mr. Charles W. Gildridge, Cowden. The total cost of the site, church, and some of the fittings will be £1,236.

Design for a Cemetery Chapel, Bethull.
for The R.D. Council.



Chapel, Berhull.

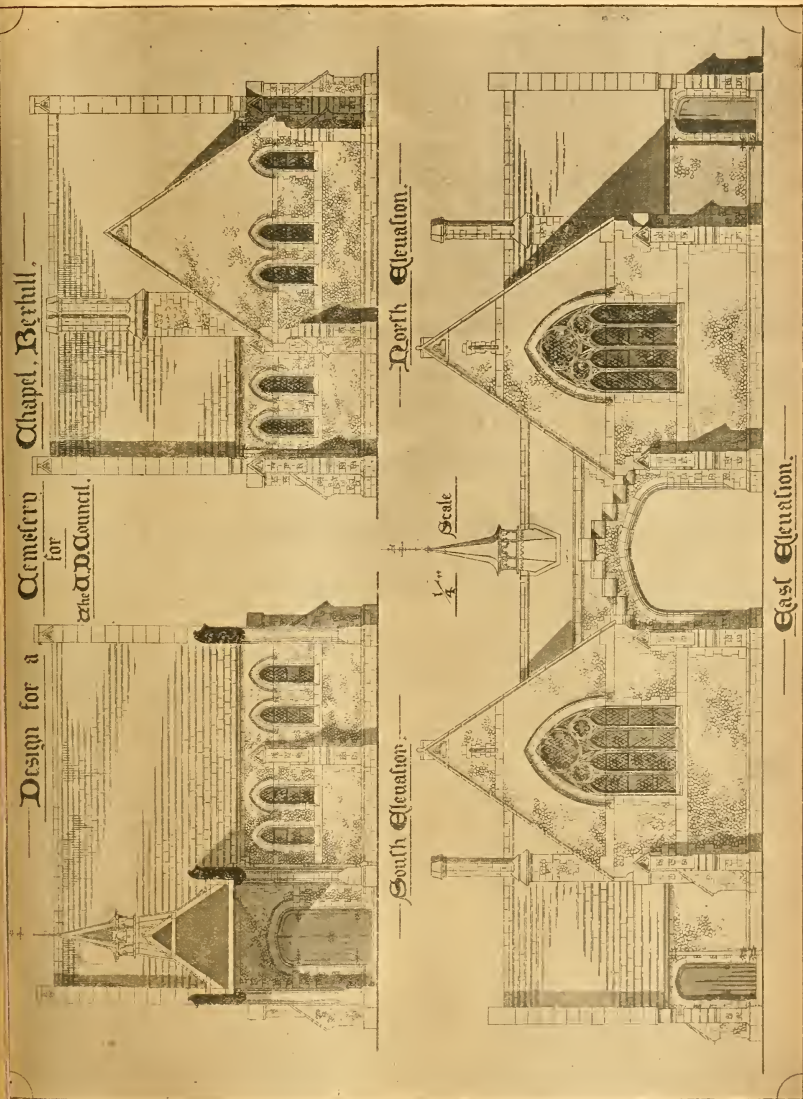
Design for a
Cemetary
for
the A.D. Council.

North Elevation.

South Elevation.

Scale
1/4"

East Elevation.



TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many demands upon the space allotted to correspondents.

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clements House, 11, Abchurch Lane, London, E.C. 4, and not to members of the staff by name. Delay is not infrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Bond orders of Vol. LXXX. are now ready, and should be ordered early, price 12s. each, by post 12s. 10d., as only a limited number are done up. The bond volumes of Vols. XXXIX., XL., XLV., XLVI., XLVII., XLVIII., XLIX., L., LI., LII., LIII., LIV., LV., LVI., LVII., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., and LXXIX. may still be obtained at the same price; all the other bond volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them are out of print.

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Front-page advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING per insertion, and Sixpence for every eight words after the first. All Situation Advertisements must be prepaid.

REVIEWER.—T. K. B. M. Bristol.—D. H. T. I. A. C. M. G.—A. D. and Co.—P.—W. and T.

"BUILDING NEWS" DESIGNING CLUB.

PURPOSE.—The staircase may lead out of the hall: that was the intention, and not to be in the hall. It is rather late to ask a query, but the object of the competition, when so many designs were in an advanced condition.

Intercommunication

QUESTIONS.

[11792]—Facing on Old Cement Work.—Will some practical reader kindly inform me what is the best material to put on walls that have been coated with Portland cement which is difficult to remove. An addition is to be made to a building, and wall coated with cement to form an interior wall, and has to be finished to match the new walls to be covered with lime plaster. Full particulars will oblige.—W. W.

[11793]—Leveling.—Will anyone give names of firms treating solely on the above, with the view of finding the same house as last one on my subject? Site about 100 ft. by 50 ft., and 10 ft. thick.—L. V.

REPLIES.

[11794]—Force Necessary to Sustain Carriage on Inclined Road.—The question may be answered thus: Inside weight of carriage by the inclined plane of 10 ft. If weight and carriage is, say, 1,500 lb. and the inclined length of the road is 20 ft., with a rise of 10 ft., the same will be 1,500 ÷ 50 lb. If put in another way, W multiplied by length of incline = F multiplied by length of plane, or 1,500 × 10 = 3,000 = F ÷ 20; therefore 20 times F = 6,000 = 3,000, or F = 3,000 ÷ 20.

[11795]—Zinc-White.—One should look up "The Chemistry of Paints and Pigments," by A. H. Church, M.A., F.R.S., of Seeley and Co.—ROBERTS'S PARK.

[11790]—Quantities.—If the prices was made as stated: "Allow for profit and waiting upon same," the contractor cannot honestly charge for the latter, as it is part of the contract. Probably he is directed to make the allowance, if so, it is his mistake.—N. T.

[11791]—Bonding Bay-Window to Brick Wall.—It is generally the practice to make a recess or groove in the brickwork, and to do some kind of window joint. The stonework need not be bonded; in fact, it allows for settlement of the brickwork and the stone. The stone head of window, which is bonded into the work at top. If the brickwork settles, the stone head will settle with it, and there will be no unequal settlement. If there is any risk of settlement or falling away of the stone bay window, the brickwork should be bonded into the wall. When the wall under window-sill and mullions is well built, ties are unnecessary.—ABRU.

CHIPS.

The town council of Blackpool, at a special meeting held last night, unanimously adopted a proposal to approve of an application for a provisional order to alter the Improvement Act of 1890 so as to allow of the Promenade being widened 100 ft. instead of 60 ft., and to borrow a further sum of £10,000. The cost of the work, which is to be commenced forthwith, will be about £250,000.

The Maryport Harbour Commissioners have received the report of Messrs. Baker and Hurlitz, the engineers called in for advice as regards the improvement of Maryport Docks. They recommend a new entrance to the South Dock, and a new pier, deepened the dock to be widened 110 ft. and deepened the construction of a timber jetty and new quay, and the installation of hydraulic power, at a cost of £145,000.

The gas committee of the West Bromwich Corporation have appointed Mr. Goy, assistant engineer at the Stockport Gasworks, as manager at their works at the Albion, West Bromwich, in place of Mr. T. Glover, resigned. The salary is £450 per annum. There were nearly fifty applicants for the appointment.

The consecration of an addition to the Church of St. Saviour, Ravenshoe, took place last week. Mr. C. Hodgson Fowler, F.S.A., of Durham, the architect, has designed the addition in 13th-century style, and for the central part of the church, a transept, with a rose-window in the south transept, morning chapel, organ-chamber, enlarged vestry, &c. These are completed, and form the portion just consecrated. There are further additions to occupy the site of the present campanile, and a clerestory and arcading for the nave and north aisle. The cost of the whole will be £8,600, and seats will then be provided for 550 persons. About £5,500 has been spent so far.

There has recently been placed in Culmington churchyard, by the family of the late Captain Gordon Wood, a monument of Aberdeen granite in the form of an Ionic cross. The memorial was executed by Messrs. Marshall Bros., Shrewsbury. The foundation-stone of a new infants' school was laid at St. Anthony's, Newcastle-on-Tyne, recently. The school, which will be built near the church, is the gift of Lord Northbourne. The building will comprise a schoolroom 73 ft. long and 53 ft. wide, with a folding screen and class-room, and it has other modern accessories, such as a cooking-room, &c. There will be a large playground about 100 yards in extent. Some 200 children will be accommodated. Mr. M. D. Wright, of Newcastle, is the architect, and Mr. W. S. Anderson, Hunter-row, Newcastle, the builder.

The Right Hon. A. Graham Murray, K.C., M.P., Lord Advocate, has opened the new church-halls and rectory which have been provided for St. George's, Newcastle-on-Tyne, by the Episcopal Church, Dundee. The buildings have been erected on a site in Well-road, in the west end of the city, and have involved an expenditure of £9,000. The principal hall, 24 ft. by 50 ft., seats 1,300 people. Below the larger hall is a smaller one to seat 300 persons, and attached to it is a gymnasium. The rectory is in front of the halls, and is four stories in height. The buildings are lit by electricity.

Princess Christian has consented to lay the foundation-stone of the new school for the indigent blind at Leatherhead, which will replace the one in St. George's-circus, Southwark, recently sold to the promoters of the new Electric Street Electric Railway as a site for a generating station.

At the Manors, Newcastle-on-Tyne, a new power-station for the supply of electricity to the city tramways is being erected for the corporation from plans by Mr. Benjamin F. Simpson, F.R.I.B.A., Newcastle-on-Tyne. It is not being erected in, and some of the machinery has already been erected within it.

At a recent meeting at Colchester a scheme, prepared by Mr. John Meldrum, chief engineer to the Colchester Corporation, and Mr. W. S. Anderson, for the erection of a bridge across the River Colne, between Wyvenhoe and Howbridge, and a few miles below Colchester. The estimated cost is £5,000.

LEGAL INTELLIGENCE.

ELECTRIC TRACTION ON THE UNDERGROUND RAILWAY.—The Hon. Alfred Lyttelton, K.C., M.P., sat on Monday at 8, Richmond-terrace, Whitehall, as arbitrator between the Metropolitan and Metropolitan Railway Companies. The Company of the system of electrical traction to be adopted upon both lines of railway. The Metropolitan Railway Company desire the adoption of the Ganz system, and the Metropolitan Railway Company advocate that proposed by Mr. Yerkes. Mr. Crisp, K.C., representing the Metropolitan Railway Company, asked for an adjournment until the end of this month for the purpose of calling the witnesses. Mr. Lyttelton, K.C., for the District Railway Company, opposed the application, but it was eventually agreed that the arbitration should be postponed until Tuesday, October 29.

IN RE ALFRED GILBERT.—A sitting for public examination was held before Mr. Registrar Linklater on Tuesday. The debtor, residing at Maids Vale, is the well-known sculptor and Royal Academician. It appeared from his statements that he has followed his profession for the last 24 years, and down to 1894 had made a considerable income. Since that year, however, his earnings had fallen off, and his expenses increased, owing partly to his having been engaged in completing the unfinished works of the late Sir Edgar Boehm to the neglect of his own business, and partly to his undertaking commissions for large statuary, which necessitated the acquisition and building of a studio. He returns his gross liabilities at £24,558 of which £12,812 are expected to rank, and no available assets. The examination was closed.

Princess Henry of Battenberg, Governor of the Isle of Wight, has consented to attend, in the official capacity, the ceremony at Freshwater which will mark the inauguration of the new railway from the Isle of Wight with the mainland by means of the Solent Tunnel. As at present arranged, the ceremony will take place early next year.

In connection with the proposed new water scheme for Linsithgow, Mr. J. M. Macdonald, of Linsithgow, visited Linsithgow on Saturday, and inspected three waterfalls, with view of advising the town council as to the means to be taken to obtain an additional supply of water.

The new Wesleyan schools at Romiley, which have been erected to replace the ones destroyed by fire, were opened on Saturday. The new building which has cost about £14,000, is only a portion of a scheme which includes the erection of a new church at a cost of about £2,000.

At a special meeting of the shareholders of the Buxton Gardens Company on Friday, a scheme presented by the directors for a new theatre was after a little discussion as to style of architecture, and a vote of £25,000, including a reconstructed entrance to the gardens. Mr. Frank Matcham will be the architect.

A linguist tone characterised the business at Tokenhouse-yard Mart last week, and, although the exchange was of any note took place. A demand existed for shops and residences in suburban close to London. The total amount realised by the week's sales was £40,705, as compared with £27,000 for the corresponding week of last year.

At the annual meeting of the Gaiety Theatre Company on Tuesday the chairman referred considerable length to the contemplated rebuilding of the theatre, the London County Council have acquired the present site for the new theatre, and the company have been granted for the new theatre, which they were to take at the same rent, and they had pledged themselves to expend £30,000 on the new theatre. This amount, of £20,000 which had been received as compensation, would be provided by the County Council. They were further guaranteed that they should be able to walk from the new theatre to the old building until the new theatre was finished. After settling a few details, therefore, the company had £72,000. The cost with which to build the new theatre, and the cost of the new theatre would be between £50,000 and £70,000. They were obliged by their arrangements with the County Council to spend £50,000 on it, but, owing to the high price of building materials, the company would amount to the sum mentioned. The directors report was adopted.

The city council of York resolved on Monday to prepare an additional £200,000 for further extension of electric tramways, and to offer Mr. W. H. Messers, Kincaid, Manville, and Waller, of Westminster, 100 guineas to advise on the route, suitable to be adopted in connection with the laying of lines for tramways.

Our Office Table.

The first lecture to students of the Royal Academy Schools was given on Monday evening by Professor A. H. Church, who is lecturing in his course of six lectures on Mondays and Thursdays with "The Chemistry of Pigments." On Monday, the 28th inst., Mr. Arthur Thomson discusses "Details of Anatomy" in an opening address with demonstrations, which begin on Tuesday, the 29th inst. Mr. Val C. Prinsp, R.A., will give his lectures on "Painting." On Thursday, January 13 to 23; Professor George Atcheson, R.A., his on Architecture from February 22 to February 13, and Mr. Alfred Gilbert, R.A., on Sculpture, from February 17 to March 16.

Under the auspices of the Sanitary Institute a conference on Water Supply and River Pollution is to be held on Wednesday and Thursday in next week at St. Andrew's Hall, Oxford-street, W. It is proposed to treat the subject in its widest sense, and to discuss: sources of supply and watershed areas, storage, town and village supplies, filtration, purification and sterilisation, distribution, apparatus (filters, tanks, etc.), and prevention of river pollution. In connection with the conference an exhibition of models and latest appliances used in the distribution and purification of water will be arranged in St. Andrew's Hall. Silver and bronze medals will be awarded. The subjects for discussion on the first day will be sources of supply, watershed areas, town and village supplies. Sir Alexander R. Binnie will preside, and papers will be read by Mr. J. Parry, M.I.C.E., Drs. E. C. Seaton, H. R. Mill, A. Greenwood, W. Willoughby, and J. C. Thresh, and Miss C. Buchanan. On Thursday the chair will be taken by Mr. W. Whitaker, F.R.S., and water filtration, purification, and sterilisation will be treated in it papers to be read by Professor Harry Robinson, Drs. H. R. Kenwood and S. Rideal, Messrs. A. G. Leigh, H. W. Russell, and Frederick Verney.

A SUGGESTIVE paper on "The Workmen's Compensation Acts of 1897 and 1900" was read by Mr. Muir Wilson of Sheffield, at the twenty-eighth annual congress of the Incorporated Association, held in the Sheldonian Theatre, Oxford, on Tuesday. Mr. Muir Wilson discussed the practical results of the working of the Acts as affecting the workman, suggested different views that might be taken of questions that have been upon, and invited discussion upon points on which the statutes might be amended and amplified. He reviewed the numerous questions which have arisen under the Acts in question, and discussed the leading cases arising upon them. In the matter of appeals, he said that the present conditions under which an appeal might be brought was presenting a scandal so serious as to excite the contempt of the ordinary lay mind. There were 49 appeals undisposed of in the list. The last day on which any appeal was heard was March 13, 1901, since which time the arrears had been accumulating. He suggested that to do so in spite of the Long vacation, thereby causing a delay in the decisions of the judges. The amendments of the statute which he suggested were as follows:—(a) In section 1 (1) omit the words "by accident" and so disjunctive with the doctrine laid down in the cases of *Wheeler v. Leicester*, *Wright v. Lloyd v. Sugg*, *Timmins v. Leeds Forge*, and similar decisions as to the element of fortuity. (b) Section 7 (1).—Repeal the whole of this sub-section and extend the Act to all workmen as defined in the Employers and Workmen's Act, 1875 (38 and Vict., c. 90, s. 10), and include seamen and apprentices. Amend (2) to be in accord with this proposed amendment. (c) Schedule 1 (3).—Confer upon the workman a right to apply to fix a lump sum as redemption of any weekly payment. (d) Schedule 2 (8).—Omit all provisions dealing with registration of a "memorandum of agreement."

An amended Parliamentary return has just been issued in substitution for that issued on Sept. 1 last giving the return of the work done on the Land Registry under various Acts (13). It shows the amount of fees received by and the amount of salaries and expenses on the Land Registry from April 1, 1900, to March 31, 1901. A mistake has to have been made in the original return in the number of leasehold estates the titles to which are registered on first registration. The number

of such estates was given as 781, whereas the figure should have been, according to amended return just issued, 8781.

A TEST was recently made in the presence of the architects of the building, the assistant city engineer of Toronto, and others, of an expanded metal door, constructed by the Expanded Metal and Fire-proofing Company, Limited, in the new St. Lawrence market building, Toronto. A weight of over 20,000lb. was placed on an area 12ft. by 4ft., or to figure it out as a distributed load, about 4200lb. per sq. ft. of area. This load, which was up to the limit of the strength of the girders, was carried without sign of failure, and was considered entirely satisfactory. This building has nearly 50,000ft. of unbroken fire-proof floor area.

The American Institute of Architects held its thirty-fifth annual convention at Buffalo last week, from Thursday till Saturday. Papers were read by Mr. Cass Gilbert, Mr. W. A. Boring, and Mr. John H. Rankin, on the effectiveness of the Tarzney Act, and suggestions for amendments. The other papers read had reference to the Pan-American and other exhibitions, and included the following: "Some Phases of Exposition Making," by Mr. Carleton Sprague; "The Management and Design of Expositions," by Mr. Thomas R. Mather; "The Exterior Color Effects of the Pan-American Exposition," by Mr. C. H. Turner; "The Electrical Installation and Decorative Effects of the Pan-American Exposition," by Mr. Luther Stieringer; and "Government Architecture at Expositions," by Mr. E. A. Crane.

The report of the Ontario Bureau of Mines for 1901 gives the aggregate value of the building materials produced during the year 1900, including under this term stone, lime, common brick, pressed brick, and terra-cotta, 2,689,351,000, compared with 2,621,282,000 in 1899, an increase of 67,069,000. Judging from these figures, says the Government report, the building trade remained in a fairly active condition. Part of the increase is due to a rise in prices, the average cost of lime per bushel in 1900 being 13-9 cents as against 12-2 in 1899, and common brick being valued at 9-73 per thousand as against 9-01, 61 cents in 1899. Drain tile, paving brick, and sewer pipe showed a falling off in output, which were more than made up by an increase in pottery. The manufacture of cement continues to expand in Canada, the total production of 1900 being 1,000,000 barrels, more than in any previous year. The increase in Ontario is wholly in Portland cement, the natural rock variety being smaller in output and value than in 1899. The raw materials for an excellent quality of Portland cement—marl and clay—being abundant in Ontario, and the demand for permanent construction purposes is growing and constant. The large likelihood that the production will continue to increase. The number of cement works reporting to the Bureau last year was nine, of which four made natural or rock cement and five Portland cement. In addition to the factories now in operation, one or two others will place their product on the market during 1901. The large increase in the total quantity of cement produced in the provinces in 1900 as compared with 1899 of 70,117 barrels, and in value of product of 138,749,000. The average price at which the cement was reported to the Bureau was 79 cents per barrel, natural rock and lime 93 cents as against 70,117 barrels, and in value of product of 138,749,000. The average price at which the cement was reported to the Bureau was 79 cents per barrel, natural rock and lime 93 cents as against 84 cents and 2-00 per barrel respectively in 1899. The imports of Belgian and German cement, which had risen from 79,370,000 and 15,603,000 respectively in 1896, received a decided check last year, while those from Great Britain were, it is satisfactory to learn, not so doubtful and constituted a larger proportion than in 1896, when they were 123,436,000, worth out of a total importation of 252,882,000.

The urban district council of Camborne decided on Monday to purchase a site in Trevenon and Cross streets for municipal offices.

At the Alexandra Palace on Saturday, the unveiling of the Queen Victoria Statue took place in the concert hall. The statue, in stone, appears on a high pedestal, occupying a central position, facing the organ. It is the original plaster cast after the sittings given by the late Queen to the sculptor, Mr. John Gibson, F.R.S., by whom it has been given to the trustees. It is covered with bronze, so as to make it represent the actual bronze work that was unveiled by Earl Roberts at Manchester on Wednesday.

MEETINGS FOR THE ENSUING WEEK.

MONDAY. Clerks of Works Association. Monthly meeting. "Carpenter's Hall, K.C." 7.30 p.m.
WEDNESDAY. Conference on Water Supply and River Pollution. St. Andrew's Hall, Oxford-street, W. 10 a.m.
THURSDAY. Conference on Water Supply and River Pollution. St. Andrew's Hall, Oxford-street, W. 10 a.m.
FRIDAY. Architectural Association. Discussion Section. "Stables and Stable Filings," by H. Gregory Collins. 7.30 p.m.

THE ARCHITECTURAL ASSOCIATION.

THE DAY SCHOOL will OPEN ON MONDAY, October 15th. Entrance papers are issued to all persons desiring to attend. The Secretary is Mr. J. H. P. G. MACLE. The EVENING SCHOOL, also, opens on OCTOBER 15th. A pamphlet, containing full information and nomination forms for membership, may be obtained on application to the SECRETARY at 36, Great Marlborough-street, London, W. R. P. ALFORD H. P. G. MACLE, Hon. Secs.

CHIPS.

We are glad to learn that Mr. Alfred Waterhouse, R.A., continues to make satisfactory progress at his Berkshire residence, Yatton Court, near Newbury, and during the past week has been able to take a little exercise.

The rural district council of Sturminster have retained the services of Messrs. Beesley, Son, and Nichols, civil engineers, of Westminster, for the preparation of a scheme of water supply for the district.

On Saturday afternoon, St. Gabriel's Episcopal Church, Greenfield-street, Govan, was dedicated by the Bishop of Glasgow and Galloway. The church is plain Norman in style, and built of red pressed bricks, with white stone facings. Adjoining is a hall, which can be so arranged as to form a north chapel. The church is seated to accommodate 300, and the hall 170 persons. The buildings have been erected at a cost of £2,000, from plans prepared by Mr. James Chalmers, architect, Hope-street, Glasgow.

The city and waterworks engineer of Leeds, Mr. Thomas Hewson, has been instructed by the corporation of that borough to report fully upon the disposal of the sewage of the city in view of the rejection of the Gateforth Bill.

The first instalment of an extensive scheme for supplying Belfast with water from the Moine Mountains district, a distance of forty miles, was successfully inaugurated on Friday. The entire works are costing one and a half million sterling, and when completed 35,000,000 million gallons of water can be brought to the city. The works are the property of the Belfast Waterworks and Sewerage Company, Ltd., and are being carried out by Messrs. Fisher and Le Fourn, Dublin, and J. Martin, Belfast; John Patterson and Sons, Glasgow; and Henry Laverty and Son, Belfast; cast-iron pipes were supplied by D. Y. Stewart and by R. Lawday, Glasgow; also by the Stanton Ironworks and Birmingham. The pipes came from Glasgow and the Steel Company of Scotland, but they were all rolled and made up by Pigott and Co., of Birmingham; and all the automatic valves, gearing, and special fittings were supplied by the Glenfield and Kennedy Works, Kilmarlock.

To the Church of the Holy Angels, Hoar Cross, the Hon. Mrs. Meynell-Ingram, who built the church as a memorial to her husband, has just caused to be added a morning-chapel. This has been so planned by the architect, Mr. G. F. Bodley, R.A., as to form a part of the main building, on the south side of the chancel. The roof is panelled in oak, with carved tracery intersected with roses, and the whole is decorated with a fine pattern of black-and-white marble, while a stained-glass window enriches the general effect.

Three small lancet windows at the west end, beneath the gallery, of Shotton new church have been filled with stained glass, by the son and daughter of the Dean of Lincoln in remembrance of Mrs. Gladstone—subjects, Virgin and Child, St. Ethelwold, and St. Hugh. The church itself, which has thus far cost about £7,000, and has been for the past three years in course of erection, is nearly completed.

On Saturday a memorial of the late Mr. James Cropper was unveiled in the Abbott Hall Public Recreation Grounds, Kendal. It consists of a medallion portrait in bronze, modelled by Signor Lucchesi, set in a tablet of Westmoreland stone, the masonry being executed by Messrs. Bromley, of Keswick, from a design by Mrs. Rawnsley.

A new mission church in Pennington-street, Woodhouse Ridge, was dedicated on Saturday afternoon by the Bishop of Ripon. The building, which is named after St. Gabriel, and will seat 300 persons, has been erected from the designs of Mr. G. W. Atkinson, at a cost of £1,450, exclusive of furnishing and site.

Trade News.

WAGES MOVEMENTS.

BRADFORD.—Last week it was believed there was very probability of the dispute in the Bradford building trade being settled; but unfortunately difficulties have arisen, and feeling has become more intensified. The matter addressed a letter to the Press, putting the case before the public, and in the course of this they say:—"We claim to be not only a union for the protection of our trade, but also a philanthropic society, as last year we paid to members out of the accident fund £1,303, to hospitals £287 8s., and as superannuation to members unable to follow their employment £5,916. We have come to the conclusion that the main aim of the master builders is to cripple our society. If they do not soon come to terms they may shortly find that 9½d. per hour will not suffice, but they will be confronted with a demand for 10d. per hour, and, according to the state of trade in Bradford, they will have great difficulty in opposing it."

HULL.—The slaters' strike entered on Monday upon the eighth week, and a somewhat singular state of things was witnessed in the afternoon. This was the arrival in Hull of four of the Yorkshire masters, who have gone to that city to take the place of as many men who are on strike. They were met at the station by Hull officials of the Masters' Union, and at once adjourned to an hotel for refreshments. After this they mounted the roof of a building that is being erected as a Nurses' Home, near to the Infirmary, and at once commenced work. The men, however, surrounded by the group of strikers, who began to argue with them, thinking they were mere journeymen, and they did not find out their mistake until they were ordered by the police to move on and not interfere with work.

ST. ALBAN'S.—The strike of builders in this city, which has been in progress this 17 weeks, has ended, entirely in the employers' favour, no concessions being granted. The men went back to work on Monday on the old terms.

CHIPS.

After being rebuilt at a cost of nearly £2,000, the Welsh Congregational Church in Llanfyllte, Llangollen, was reopened for public worship on Sunday. The church, which was destroyed by fire, was prepared by Messrs. O. M. Roberts and Sons, architects, Portmadoc, and the contract was carried out by Mr. J. T. Jones, Ceirn Mawr, Ruabon.

The foundation-stone of a new mission church was laid at Smithwick last week. The building will cost £5,000, and the architect is Mr. F. T. Beck, of Wolverhampton.

The Docks Engineer of Bristol and members of his staff are busily employed at Avonmouth in taking soundings and making borings, in order to prepare specifications for the construction of the new dock. This preliminary work will occupy some weeks, and the cost will probably be a couple of thousands pounds. No time will be lost in commencing the dock works.

Mr. B. T. Batford will issue early in November a revised and enlarged edition of "A History of Architecture on the Comparative Method," by the late Professor Banister Fletcher and Mr. Banister F. Fletcher. This edition has been revised and considerably enlarged, and the new edition includes the Sarcenic and Eastern styles. It now has 256 full-page plates, one half being from photographs of buildings, the other from specially prepared drawings of constructive and ornamental detail, including over thirteen hundred illustrations.

The committee appointed by Chester Corporation to put into operation the Housing of the Working Classes Act, part 3, have decided to erect forty working-class houses on a site known as Tower-field-gardens, near the electric light station, and the property belongs to the corporation, it is expected that they will be able to let the houses at a reasonable rental.

The corporation of Heywood, Lancs. have decided to advance the salary of the borough engineer, Mr. J. Answorth Sedley, A.M.I.C.E., by £50, making it £300 per annum.

Material progress is being made with the 'Craiguen' harbour scheme. Mr. W. Simpkins, C.E., of Messrs. D. and C. Stevenson, engineers, of Edinburg, with two assistants, engineers, are now marking out the positions of the piers by means of buoys, and the ground necessary for the construction and working of the harbour has been pegged off. Boring operations are in progress, with a view to ascertaining the position of the rock foundations for the various works.

Drillington Corporation have embarked upon a drainage scheme prepared by Mr. E. R. Matthews, C.E., to cost £4,000.

The corporation of Rochdale have decided to apply to the Local Government Board for sanction to borrow £3,300 for the purchase of land for the widening of Edenfield-road, Bury-road, Halifax-road, and Woll-1-st.-lane.

James Wallace Bogue, residing at 13, Earlston-place, Alhambra, passed the bar of the Edinburgh Police-court, on Thursday last week, and was remitted to the sheriff on a charge of bigamy. Bogue is a married man, sixty-two years of age, and is described as a retired architect, while the woman with whom he is alleged to have contracted a bigamous marriage is said to be twenty-six. The allegation is that the ceremony took place in Edinburgh on April 27, 1900, while Bogue's wife was still alive.

The gas committee of the corporation of West Bromwich have appointed Mr. Copp, assistant engineer at the Stockport Gasworks, as manager at their works at St. Albion, West Bromwich, in the place of Mr. T. Glover, resigned. There were nearly fifty applicants for the appointment.

At the quarterly meeting of the Belfast Corporation, last week, an extra sum of £30,000 was voted for the new City Hall, in order to make certain improvements in the drainage. It was arranged to borrow £30,000 for the erection of the infectious diseases hospital. The question of borrowing money for the sewage purification scheme was referred to the committee.

Recent researches have enabled exact dates to be assigned to the erection of the well-known Prior Bolton's window and the Waldon chapel in the north aisle of the church of St. Bartholomew-the-Great, West Smithfield, which adds to the interest of this otherwise important building. The dates will be given at the usual autumn lectures, which will take place to-morrow (Saturday afternoon), October 12, and the following Saturday, October 19, respectively. No tickets are required, and the lectures are quite free.

The memorial-stone of a new Board school which is in course of erection in St. Mary's-road, Newton Heath, was laid on Saturday afternoon on behalf of the Manchester School Board. The school will accommodate 1,050 children on a 10½-ft. basis in two departments, and will have a large central hall, classrooms, cookery, and manual instruction rooms.

Miss Devaynes, of Updown House, Margate, was summoned on Monday for assaulting the assistant borough surveyor of Margate, who, acting on instructions, recently measured the depth of water in certain wells, among them being one of the deep wells of Miss Devaynes, which was alleged to be a thief and scoundrel, and broke her walking-stick over his back. The defence was that he ought to have obtained permission, and that he was assaulted by the thief. The magistrate inflicted a fine of 6d. only.

The Local Government Board has appointed Mr. James Green (Weatherall and Green) as valuer of the various properties alleged to be "battered" by the London County Council in connection with the Westminster Improvements and the Thames Embankment extension.

The annual general meeting of the 19th session of the Sanitary Inspectors' Association was held on Saturday night at the Parkes Museum, when the report of the committee was read and adopted. The report showed that very satisfactory progress had been made during the past session. A very large accession of ordinary members and associates had been realised.

A new Wesleyan chapel was opened at Butterwick, near Boston, Lincoln, on Friday, and the foundation-stone of another was laid at Great Hale. New Wesleyan chapels are also to be erected at Kirton and Wainfleet.

Boroughridge Wesleyan Chapel has been beautified by the installation of stained glass windows, the lights facing the pulpit, the gift of Mr. H. Hawkin, Ellenthrope. The window is intersected by a gallery, and in the openings of the window above it the figures of Faith, Hope, and Charity are represented. The work was designed and executed by Mr. S. W. Knowles, of York.

Cardinal Vaughan on Saturday afternoon laid the foundation-stone of a new Roman Catholic Church of the Guardian Angel in the Mile End-road, which is to be erected as a memorial to the late Lady Margaret Howard. The cost—about £12,000—will be defrayed by Lady Mary Howard. The style is Perpendicular, and accommodation will be provided for 600 persons.

The new branch line of the Great Western Railway between Weymouth and Rhoslanherne was opened last week. The new arm of the Great Western system has necessitated an outlay of £30,000 to £50,000. The new line is a single one, for both ways, and will be worked on the electric system. There are 13 bridges along the route, and the stations number three, Rhoslanherne, Legney, and Hillyett.

A Bible Christian chapel has recently been erected in Burton-street, North Tawton, Devon, by Mr. S. Ellis. The building is of dark grey stone, and has seatings for about 150. It cost over £300.

The annual meeting of the Toronto Architectural Exhibition Club was held on September 23, when the following officers were elected for the ensuing year: Mr. Elen-Smith, president; Mr. C. H. Aston Bond, 1st vice-president; Mr. J. C. Horwood, 2nd vice-president; Mr. C. D. Mauns, 3rd vice-president; Mr. J. P. Hynes, secretary-treasurer.

Lord Avelby will open the new Central Free Library in Hull, on Wednesday, November 6.

The new Board schools, Penny Stratford, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The memorial-stones of the hall of the St. George's Presbyterian Church, Moston-lane, Harpurhey, Manchester, were laid on Saturday afternoon. The erection of the hall is part of a larger scheme. It is intended ultimately to erect a church on the remainder of the site. The cost of the hall is £1,428, and of the church £3,200.

Ladylen Urban Free Church, Arbroath, was reopened on Sunday after alterations and decorations, including the resetting and rehanging, and the insertion of a number of memorial stained-glass windows.

Colonel Hepper, an inspector under the Local Government Board, held an inquiry at Bridgewater yesterday (Thursday) into the application of the rural district council to borrow £21,000 for purposes of water supply for the parishes of Bawdrip, Chedzey, Huntspall, North Petherton, and Purton.

The Lord Mayor, on Saturday afternoon, proceeded to Edmonton to lay the foundation-stone of St. Michael's Church. The total cost of the building, which will occupy a prominent site, adjoining the mission hall, within half a mile from Lower Edmonton Station on the Great Eastern Railway, is estimated at £12,000, which will be defrayed out of part of the proceeds derived from the sale of St. Michael Bassishaw, one of the City churches recently demolished. A vicarage will be erected in close proximity to the church, the whole being built from the plans of Mr. F. S. D. Carce, F.S.A. The church will be faced with red bricks with stone dressings, and will seat 730 persons.

The Bishop of Dover on Saturday consecrated for public worship the new church built of Kentish rag stone at Longlands, Sidcup, at a cost of some £12,000.

The foundation-stone was laid on Saturday of Melville Union Free Church, Aberdeen, which is being erected at the corner site of Skene-street and Rose-street. Messrs. Brown and Watt, of Aberdeen, are the architects, and the church will be Classic in type, a feature being the campanile that rises to a height of 120ft. at the corner of Skene-street and Rose-street. The principal elevation, which is towards Skene-street, is of the Ionic order, and the church will be built with white Kemnay granite. The total cost will be over £7,000.

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LIST OF COMPETITIONS OPEN.

Underclerk—Sewage Works Scheme	£20	J. A. Bonser, R.D.C. Clerk, Talcastor	Oct. 29
Camberwell, S.E.—Baths and Washhouses, Old Kent-road (A. Saxon Seal, F.R.I.B.A., Assessor)	150s. 7d., 78s. 4d., 50s. 6d.	The Town Clerk, Town Hall, Camberwell, S.E.	Oct. 29
London, N.W.—Hearts of Oak Society's New Offices, etc. Euston-road limit 45,000	£100 merged, 47s. 45d	Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, Adelphi, W.C.	Nov. 15
Bexhill—Volunteer Hospital	£25	E. Sholto Douglas, Clerk, Town Hall, Bexhill	Nov. 23
Bexhill—Laying Out 12½ Acres of Land as Ornamental Grounds Liverpool Cathedral—Tissue style imperative—Drawings of Corridor or Excavated Work	£20	E. Sholto Douglas, Clerk, Town Hall, Bexhill	Nov. 23
Cardiff—Chapel, Cathedral-road (cost £3,000)	—	The Hon. Secretaries, Church House, South John-street, Liverpool, Jan. 1	—
Middlebrough—Mission Hall, School, and Classrooms	—	Thomas Evans, 102, Cathedral-road, Cardiff	—
Overton—Board Rooms (20 places) and Cartaker's House	—	W. R. Megeon, Woodlands-road, Middlebrough	—
Landrind Wells—Laying Out Recreation Ground, etc.	—	Henry C. Rutherford, Clerk, 4, Blvd., Southend	—
Uxbridge—Draining Scheme	£50	D. C. Davies, Clerk to Council, Landrind Wells	—
Chadderton—Stanley-road Schools	—	James Daly, Acting R.D.C. Clerk, Town, Ireland	—
	—	J. Whitehead, Clerk, School Board, Chadderton, Oldham	—

LIST OF TENDERS OPEN

BUILDINGS.

[illegible]

BUILDINGS—continued.

Hereford—New Premises	Young Women's Christian Assoc.	W. W. Robinson, Architect, 10, King-street, Hereford	—
Morley—Drying Sheds, &c.	Morley Main Firecity Works	Wm. Ackroyd and Bros., Ltd., Morley, near Leeds	—
Marley—Busmen's Precinct, Market Hill	John Arkell and Sons	John Arkell, 32, St. John's-street, Barnsley	—
Salisbury—Enlarging Malthouse and Store	John Folliott and Sons	John Harding and Son, Architects, 58, High-street, Salisbury	—
Bookham—Kitchens	Survey Union Hunt	Charles Smith and Son, Architects, Reading	—

ELECTRICAL PLANT.

Kirkcaldy—Switchboard	Corporation	Kennedy and Jeakin, 17, Victoria-street, Westminster, S.W.	Oct. 14
Latton—Fittings, &c.	School Board	William Boyle, Clerk, Wallingford-street, Ipswich	—
Leeds—Wiring	Borough Council	J. B. Mitchell, Boro' Elec. Engineer, Maxwell-road, Plumstead	—
Woolwich—Fifty Electric Motor Cars	Corporation	T. Hewson, M.I.C.E., City Engineer, Municipal Buildings, Leeds	—
Stepney, E.—Are-Lamp Columns, Fittings, &c.	Borough Council	Arthur Wright, Elec. Engr., 10, St. John's-street, London	—
Batley—Plant	Corporation	Lacey, Clirchugh, & Sillar, Engineers, 2, Queen Anne's Gate, S.W.	—
Southbourne—Electric Tramways, 21 miles	British Electric Traction Co., Ltd.	The Chief Engineer, Duntlington House, Norfolk-street, Wand. C.	—
London, W.—Electric Light, Cables, &c.	Gas Commissioners	W. H. Patterson, Engineer, 1, Princes-street, Bank, E.C.	—
Whitby—Wiring	Urban District Council	W. K. Kennaway, Elec. Engineer, Council Offices, Whitby	—
London, W.—Electric Light Carbons and Lamps (One Year)	Great Western Railway Co.	The Stores Superintendent's Office, Swindon	—
Newport, Mon.—Wires, Cables, &c.	City Council	H. F. Pugh, Chief Engineer, 1, Princes-street, Bank, E.C.	—
Boulder City, W. Australia—Electric Tramway (3 miles)	Corporation	The Office of the Agent-General, London, S.W.	Nov. 24
East London, South Africa—Engine and Alternator (30 kw.)	Corporation	Dyer and Dyer, Municipal Agents, 17, Aldermanbury, E.C.	—
Blackpool—Forty Are-Lamp Columns	Corporation	R. C. Bain, Borough Electrical Engineer, Blackpool	—
Blackpool—Arc Lamps, &c.	Corporation	R. C. Bain, Borough Electrical Engineer, Blackpool	—

ENGINEERING.

East Dundry—Borehole	Lexden and Wainstone R.D.C.	Sands and Walker, Engineers, Angel-row, Nottingham	Oct. 12
Arley—Water-Supply Works	Madley and Brodley Jt. Water Com.	Charles Craig, Dispt. Architect, Elgin	—
Much Wenlock—Warehouses, &c.	Joint Water Board	T. Stoker, C.E., Seven Way, Shrewsbury	—
Asyic Manse—Extension of Water Supply	Rivers Committee	Davidson and Garden, 12, Dee-street, Aberdeen	—
Southampton—Reconstructing Landing Stage	Guardians	Pickering & Crompton, Civil Engineers, 11, Lower-st., Whitehaven	—
Manchester—Culvert	Urban District Council	W. W. Berrington, Engineer, 2, Southampt. The Secretary, Rivers Department, Town Hall, Manchester	—
Colchester—Hot-Water Apparatus at Workhouse	Guardians	Charles E. White, 57, North-hill, Colchester	—
St. Asaph—Watering Condensers	Corporation	S. Menzies, Engineer, 2, Victoria-street, Westminster	—
Fishguard—Extension of Rosslare Pier	Corporation	J. Otway, Engineer, Inchicore, Dublin	—
Roskilde—Laying Cast-Iron Pipes (4 miles, 13in. diam.)	Corporation	James Mansingh, P. Inst. C.E., 5, Victoria-street, Westminster	—
India Office, S.W.—Engine and Tender	Corporation	The Director-General of Stores, India Office, Whitehall, S.W.	—
Buckfastleigh—Waterworks	Urban District Council	T. W. Stanthorpe, A.M.I.C.E., City Engineer, Luton, Devon	—
Shalfleet—Waterworks	Urban District Council	S. E. Tomkins, Engineer, Newport, I.W.	—
Exeter—Water-Supply Works	Urban District Council	R. W. Berrington, Engineer, 2, Southampt. The Secretary, Rivers Department, Town Hall, Manchester	—
Donkey—Water-Supply Works	Urban District Council	Charles E. White, 57, North-hill, Colchester	—
Batley—Travelling Crane	Urban District Council	J. Otway, Engineer, Inchicore, Dublin	—
Derby—Reconstructing Tramways (8 miles)	Urban District Council	James Mansingh, P. Inst. C.E., 5, Victoria-street, Westminster	—
Amble—Harbour Improvements	Urban District Council	The Director-General of Stores, India Office, Whitehall, S.W.	—
Batley—Three Lancashire Boilers, Economiser, &c.	Urban District Council	T. W. Stanthorpe, A.M.I.C.E., City Engineer, Luton, Devon	—
Blackpool—Tramway Extensions	Urban District Council	S. E. Tomkins, Engineer, Newport, I.W.	—
Voughal—Heating and Ventilating Llanette Asylum	Urban District Council	R. W. Berrington, Engineer, 2, Southampt. The Secretary, Rivers Department, Town Hall, Manchester	—
Blackburn—Two Triple-Expansion Pumping Engines	Urban District Council	Charles E. White, 57, North-hill, Colchester	—
Belfast—Reconstructing Roof over Passenger Station	Urban District Council	J. Otway, Engineer, Inchicore, Dublin	—
Olney—Reservoir, &c.	Urban District Council	James Mansingh, P. Inst. C.E., 5, Victoria-street, Westminster	—
Edinburgh—Waterworks	Urban District Council	The Director-General of Stores, India Office, Whitehall, S.W.	—
Levenshulme—Refuse Destructor Installation	Urban District Council	T. W. Stanthorpe, A.M.I.C.E., City Engineer, Luton, Devon	—
Dartford—Pumping Machinery	Urban District Council	S. E. Tomkins, Engineer, Newport, I.W.	—
Calcutta—Two Incinerators	Urban District Council	R. W. Berrington, Engineer, 2, Southampt. The Secretary, Rivers Department, Town Hall, Manchester	—
Sydney, New South Wales—Harbour Bridge	Urban District Council	Charles E. White, 57, North-hill, Colchester	—
St. Petersburg—Two Bridges over the Neva	Urban District Council	J. Otway, Engineer, Inchicore, Dublin	—
Partick—Hot-Water Meters	Urban District Council	James Mansingh, P. Inst. C.E., 5, Victoria-street, Westminster	—
Hford—Hot-Water Heating, Downhill School	Urban District Council	The Director-General of Stores, India Office, Whitehall, S.W.	—

FENCING AND WALLS.

Kendal—Stone Walling	Town Council	R. Hampton Clucas, Borough Engineer, Kendal	Oct. 15
Breintre—Boundary Walls, Fencing, &c.	Urban District Council	Frank Whitmore, Architect, Chelmsford	—
Darlington—Iron Fencing, &c., Bank Top Recreation-Ground	Urban District Council	The Borough Surveyor's Office, Town Hall, Darlington	—
Radcliffe—Stone Retaining Wall	Urban District Council	W. L. Rodwell, Surveyor, Council Offices, Radcliffe, Lancs	—

FURNITURE AND FITTINGS.

Armsley—Bookcases and Furniture at Branch Library	Leeds Corporation	Percy Robinson, Architect, 22, Albion-street, Leeds	Oct. 14
Llandudno—Furniture and Fittings for Municipal Buildings	Leeds Corporation	P. F. Stephens, A.M.I.C.E., Engineer, Caerh. Works, Llandudno	—
Woolhouse—Bookcases and Furniture at Branch Library	Leeds Corporation	The City Engineer's Office, Leeds	—
Edinburgh—Grates, Stoves, &c., for New City Hospital	Leeds Corporation	R. M. Norman, City Architect, City Chambers, Edinburgh	—
Downton—Twenty-five Bedsteads	Leeds Corporation	The Clerk, Down District Llanette Asylum, Downton	—
Kingston-upon-Thames—Furnishing Workhouse Infirmary	Leeds Corporation	Ed. Elwell, Clerk, Combe-road, Kingston-upon-Thames	—
Newton Abbot—Furnishing New Board-Room	Leeds Corporation	S. Sagar, F.A.S.A., Undertaker, Newton Abbot	—
East Ham—Furnishing Napier-road New School	Leeds Corporation	B. J. Curtis, 129, London Road, City, E.C.	—
Knaresborough—Repeating, &c., Wesleyan Chapel	Leeds Corporation	G. F. Danby, Architect, 10, Park-road, Leeds	—

PAINTING.

Bradford—School Board Office	School Board	The Architect, School Board Offices, Manor-row, Bradford	Oct. 12
Rochdale—Barnley Workhouse Infirmary	School Board	Buttsworth and Duncan, Architects, 4, South Parade, Rochdale	—
Wrexham—Shed	School Board	The Borough Surveyor, Wrexham	—
Newbury—Corn Exchange and Four Houses	School Board	S. J. Le Vincent, Borough Surveyor, Town Hall, Newbury	—
Long Eaton—Furnishing New Board-Room	School Board	John Sheldon, Architect, 1, Darley House, Long Eaton	—
Bradford—Salem Chapel	School Board	A. Haley, 118, Outer Bridge-street, Bradford	—
Leeds—Four Law Offices, South Parade	School Board	J. H. Ford, Clerk, Four Law Offices, South Parade, Leeds	—
Carlisle—Five Lockups	School Board	Geo. Dale Oliver, Court Architect, 5, Lower-street, Carlisle	—

ROADS AND STREETS.

Cockermouth—Road Widening	Rural District Council	J. B. Wilson, A.M.I.C.E., Court Buildings, Cockermouth	Oct. 12
Harrow—Lowland-road Improvement	Rural District Council	J. B. Wilson, A.M.I.C.E., Court Buildings, Cockermouth	—
Broadstairs—Tar Paving, 3,100 yards super	Rural District Council	Howard Hurd, C.E., Town Surveyor, Broadstairs	—
Aberystwyth—Boundary-road lamp supports	Rural District Council	The Surveyor, Council Offices, Aberystwyth, Mon.	—
York—Street Work	Rural District Council	Clifford Cross, City Engineer, 1, York-street, York	—
Fusion—Asphalting Footpaths, &c.	Rural District Council	G. F. Beazley, Surveyor, Market-square, Wellingborough	—
Windsor—Kerbing, &c., Spital Clewer	Rural District Council	J. Menzies, Surveyor, English-green, Surrey	—
Beckenham—Kerbing, &c., Spital Clewer	Rural District Council	John A. Angell, Surveyor, Beckenham	—
Tottenham—Village Stone Paving, St. Ann's-road	Rural District Council	W. H. Prescott, A.M.I.C.E., Engineer, 712, High-road, Tottenham	—
Widmore—Kerbing, &c., 1,000 yds., and Kerbing (40 yds.)	Rural District Council	E. Shannan, Surveyor, Market-square, Wellingborough	—
Hornsey, N.—Road Work	Rural District Council	J. Lovgrove, Engineer, 18, Highgate, N.	—
Tottenham—York Stone Paving, Seven Sisters-road, &c.	Rural District Council	W. H. Prescott, A.M.I.C.E., Engineer, 712, High-road, Tottenham	—
Ilford—Street Improvements	Rural District Council	Henry E. Sledge, A.M.I.C.E., Town Engineer, The Hill, Northfleet	—
Northfleet, Kent—Wood Paving, 7,117 sq. yards	Rural District Council	Frank Whitmore, Architect, Chelmsford	—
Bradford—Roads, Paths, &c.	Rural District Council	W. H. Phillips, A.M.I.C.E., Engineer, Southend-on-Sea	—
Southend-on-Sea—Kerbing, &c., Wood Paving Alexandria-street	Rural District Council	M. H. Chart, F.S.I., Town Hall, Croydon	—
Warrington—Making-up Streets	Rural District Council	John Brown, Borough Engineer, Town Hall, Reading	—
Chaddam—Resurfacing Gravel-road	Rural District Council	W. N. Sayers, Surveyor, 1, The Surveyor, Council Offices, Ilkley	—
Ilkley—Making-up Wilson-road and Princess-road	Rural District Council	The Borough Surveyor, Ilkley	—
Warr—Road Improvement Works	Rural District Council	The Borough Surveyor, Ilkley	—
Care—Road Maintenance	Rural District Council	The Borough Surveyor, Ilkley	—
Redbridge—Kerbing, &c.	Rural District Council	The Borough Surveyor, Ilkley	—
Grays—Kerbing, &c., Extension, &c.	Rural District Council	The Borough Surveyor, Ilkley	—
Berkhamstead—Making-up, &c., Doctor's Common-road	Rural District Council	The Borough Surveyor, Ilkley	—
Warrington—Making-up, &c., Two New Roads	Rural District Council	The Borough Surveyor, Ilkley	—
Enfield—Footpaths	Rural District Council	The Borough Surveyor, Ilkley	—
Ilkeston—Making-up Private Streets	Rural District Council	The Borough Surveyor, Ilkley	—
Johnsborough—Asphalt Pavement	Rural District Council	The Borough Surveyor, Ilkley	—
Aldershot—Forming, &c., New Road	Rural District Council	The Borough Surveyor, Ilkley	—

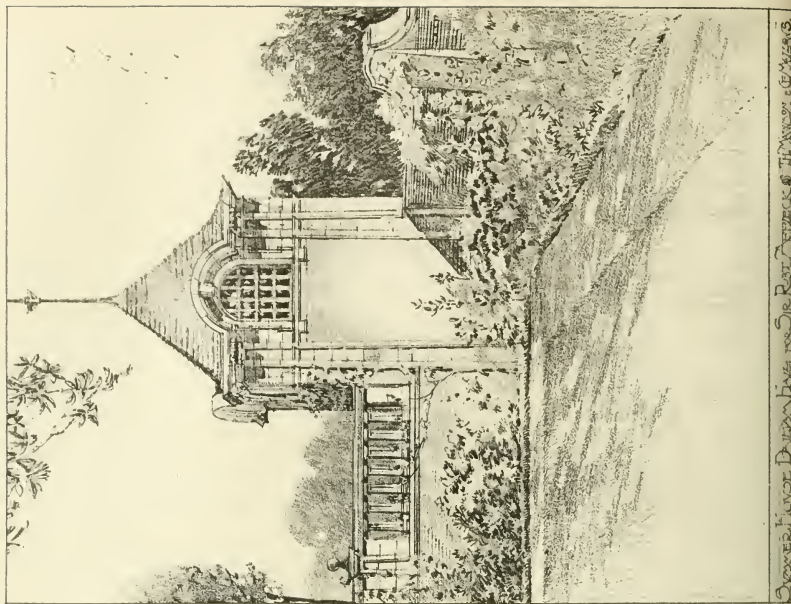
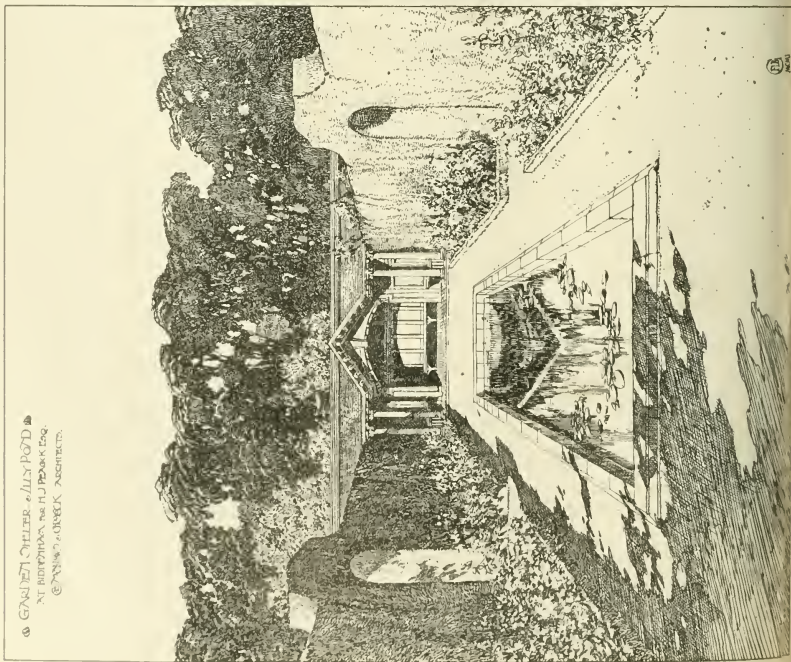
SANITARY.

Malton—Drainage Works	Rural District Council	R. Richardson, C.E., Engineer, Town Hall, Malton	Oct. 12
Ilkeston—Drainage Works at South Lodge	Rural District Council	Davidson and Garden, 12, Dee-street, Aberdeen	—
Ilkeston—Beverage Works	Rural District Council	J. B. Wilson, A.M.I.C.E., Court Buildings, Cockermouth	—

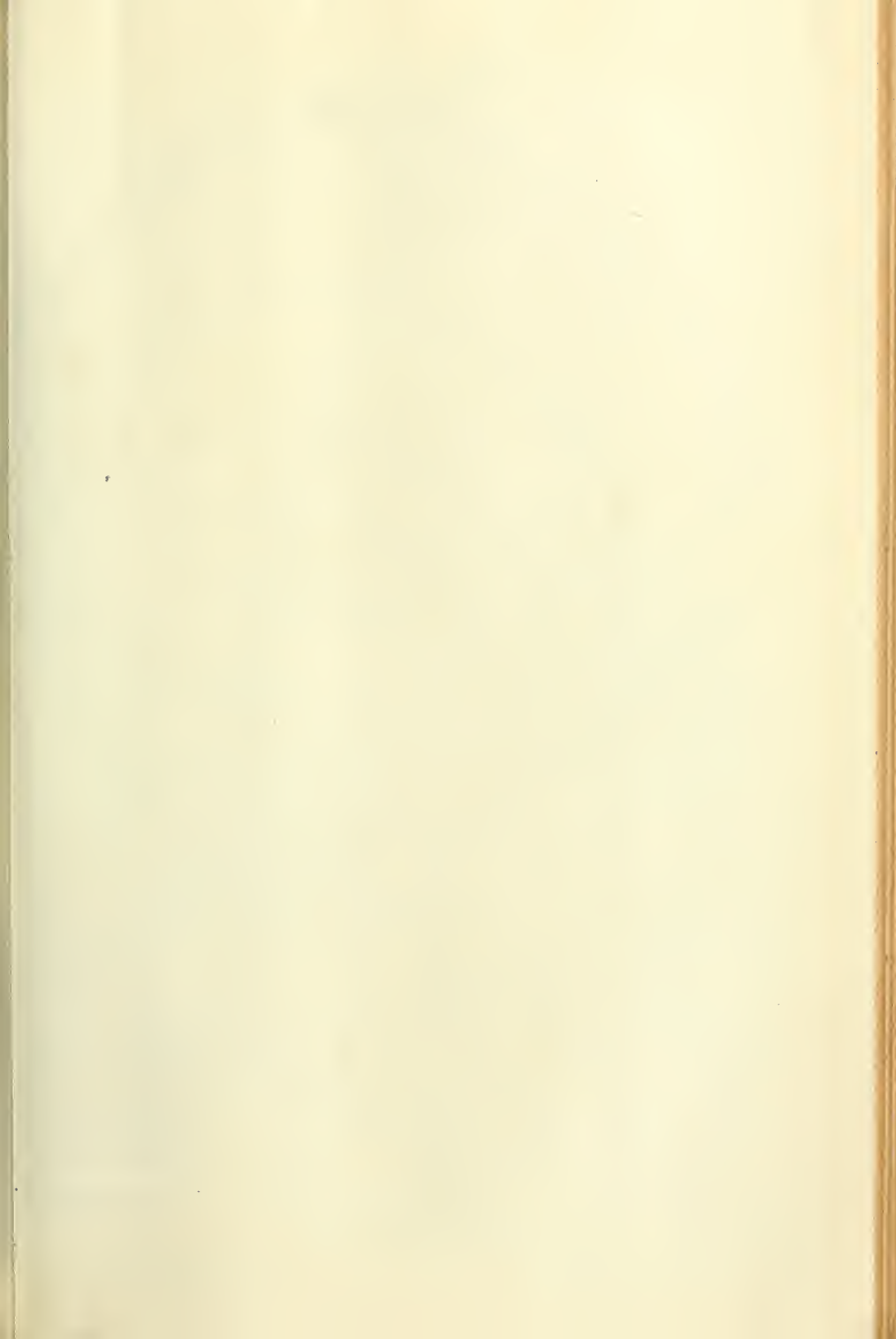


THE BUILDING NEWS, OCT. 11, 1901.

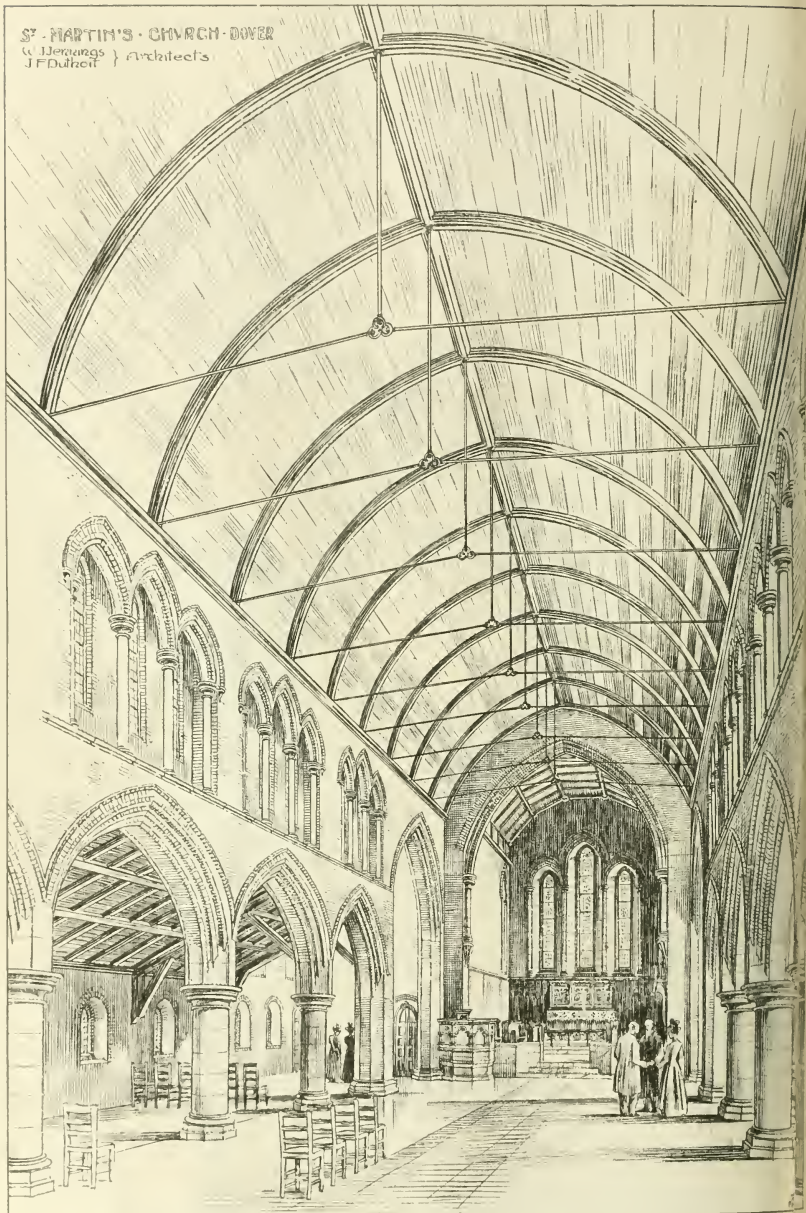
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CONSTRUCTION OF THE NEW BUILDING FOR THE
 LONDON & NORTH-WESTERN RAILWAY CO.



ST. MARTIN'S CHURCH, DOVER.
(W. Burgess & J. F. Doherty) Architects



PARK HILLS CHURCH • DUBLIN
 W. Jennings } Architects
 J. F. Dulhoy

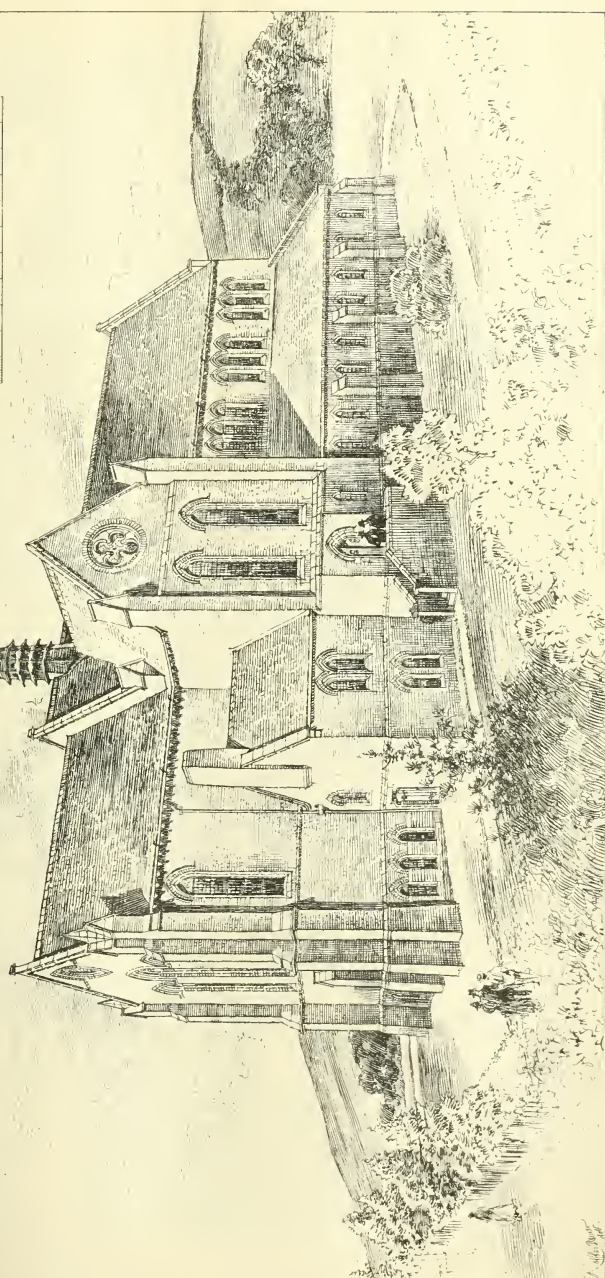
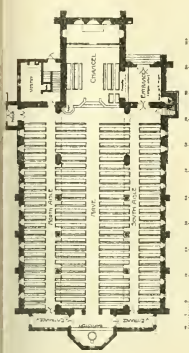
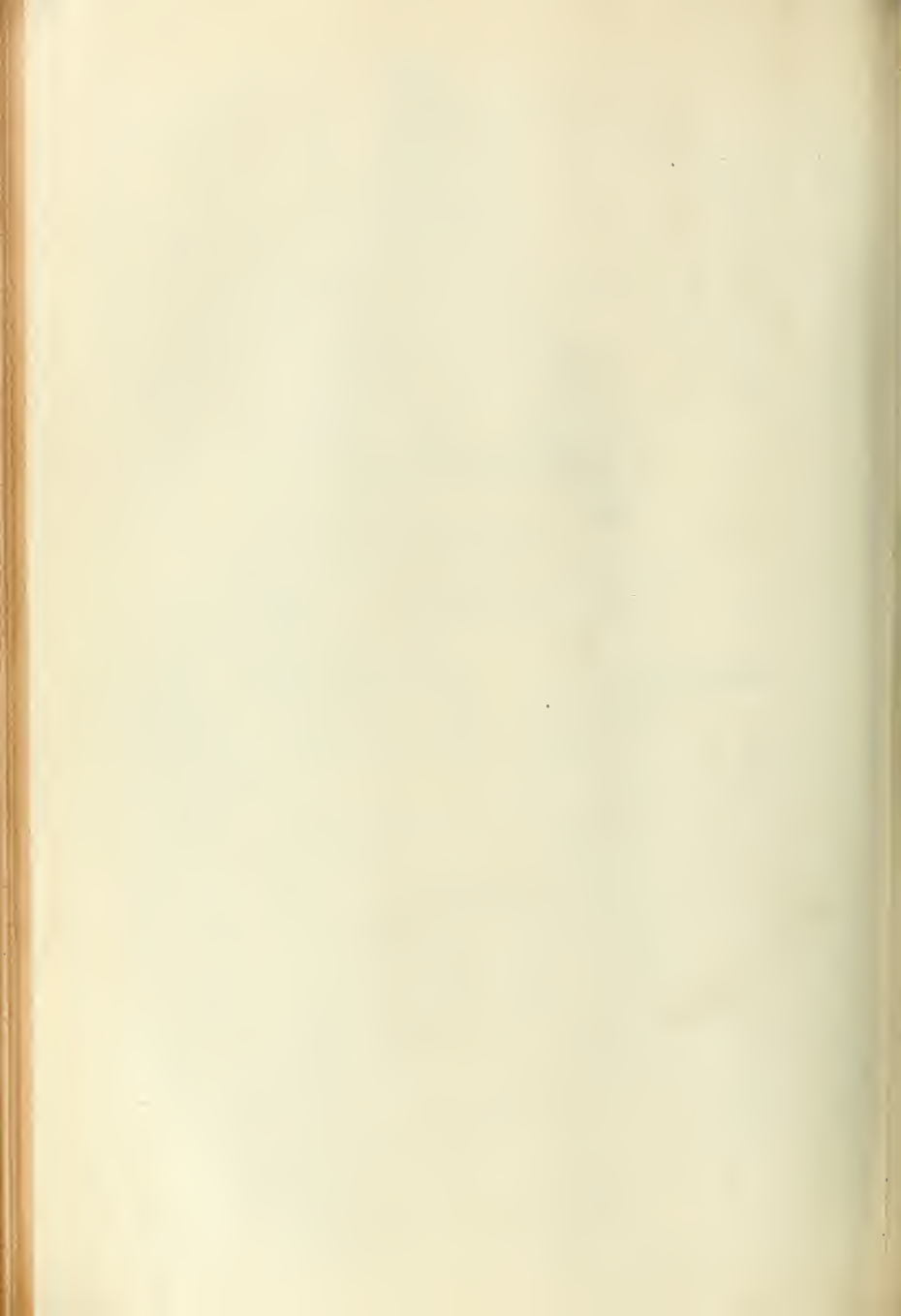
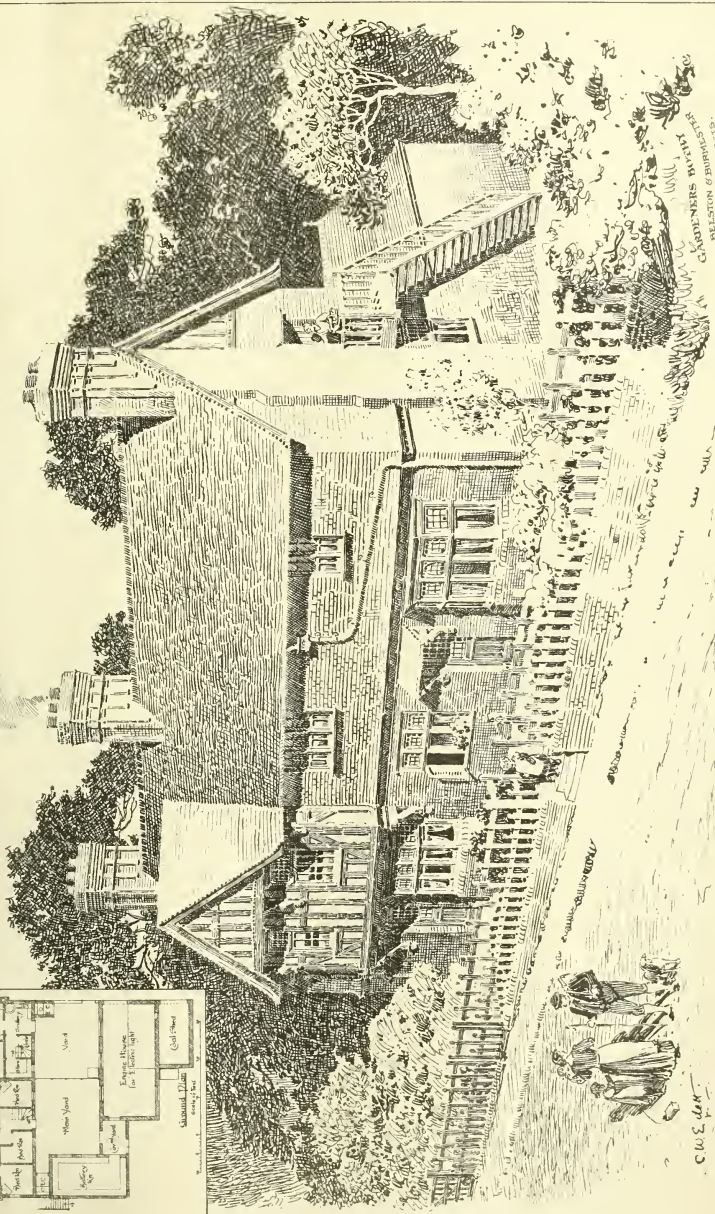


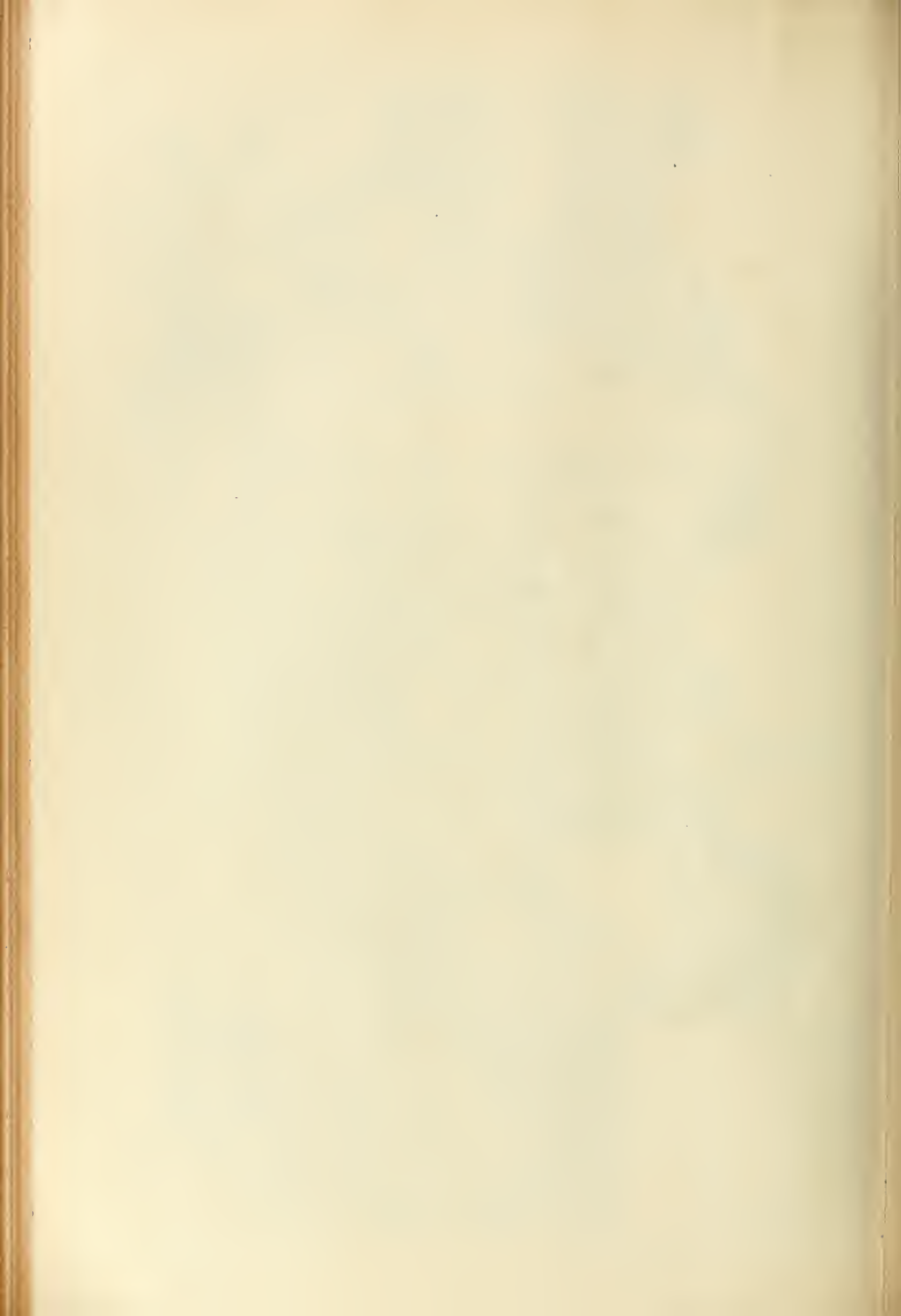
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GARDENERS HORTICULTURAL
WELSTON & BURDISTER

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THE BUILDING NEWS AND ENGINEERING JOURNAL.

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DEVELOPMENT OF PLAN.

WHEN our buildings ceased to become copies of ancient types of architecture, and we threw off the trammels of precedent to meet the requirements of modern life and its multifarious details, the study of plan became the first necessity. Up to this period, plan was an almost subordinate part of the elevations or external design—that is to say, it was more or less governed and controlled by the elevation. When a gentleman wanted a residence built in a certain style, the architect conformed to a particular model based on Greek, or Roman, or Gothic design, and made a plan that would agree with it as far as he was able. No compunction was felt to make the internal arrangements square with the elevation. If extra window openings were necessary to give symmetry without, they were at once introduced, or blank windows inserted without hesitation. The entrance must be in the centre under a portico, and it was there fixed, notwithstanding a better position could be found on one side. Writings and drawings contemporary with the reign of George IV. afford amusing evidences of the taste of that time, and the small influence that internal arrangements had on architecture. We read, for example, in Elmes' "Lectures on Architecture," delivered at institutions in London in 1820, the kind of estimate of the art which professional lecturers formed. Of the works of Chambers, Wyatt, Sir Robert Taylor, and others only the external qualities of the styles they practised in are noticed—not a word on their skill in plan or construction. Thus, speaking of Wyatt, Elmes speaks of his taste "subsequently refined by a journey to Italy and Greece," and of his design for the Pantheon afterwards destroyed by fire, and he remarks: "Possessed of genuine taste and feeling, Wyatt introduced into this country a style approaching more nearly to the standard of excellence than any that had preceded it," and he alludes to his Gothic work at Windsor Castle, the Abbey at Fonthill, and the Cathedral of Salisbury, and of his refinement and skill "equal to the several originals," save the mark! "His houses, villas, and mansions are among the most convenient, splendid, and tasteful in the country," &c., and more in this fulsome manner. Alluding to Sir R. Taylor's beautiful little Tuscan villa at Richmond, he speaks of it as being "not only his masterpiece, but one of the most original compositions in modern architecture," so also he mentions Dance's "effective elevation of St. Luke's Hospital, Holland's front of Carlton House, the tasteful halls of Some's Bank of England," and so on. Not a word is said about internal planning; all references are to the exteriors. At this time of day these remarks appear superfluous, if not ridiculous; but they indicate the partial and superficial manner in which architecture was studied. The same author who notices the new street now in formation from Pall Mall to Portland-place, and criticises the dull monotony of the elevation of many of the "new" streets with the "eternal two windows, iron railing, and a door" of the new squares and streets of Mary-le-bone. He speaks of our architecture as "selfish and internal; windows indicated externally, and made only to give light and air to the interior; doors placed in square brick holes, whose only service seemed to be to exclude strangers," were the prevalent features of English domestic buildings." This is a strange criticism, for it condemns features

that some in our day affect to admire, but it also explains the attitude of the profession of that time. The predominance of the façade was shown even in a new street like that of Regent-street, the windows of which are declared to be "selfish and internal," and made solely to give light and air. For which other reasons indeed should they exist? But the demand was for an attractive external front, the new street failed to give this; yet, all the same, it was admired as a huge curved façade pierced by windows in monotonous regularity. We have miles of such fronts in Bloomsbury streets and squares, and the phrase "selfish and internal" would apply to the "Gower and Baker-street" description of houses. Many of the houses in these localities are well planned internally, their chief approach being the wearisome monotony of their façades. Their distinguishing character was that of self-compacency and selfish disregard of those outside their portals, as they made no effort to please the outside public by architectural decoration. At a later period the plain external elevation was replaced by lavish detail and ornament, as during the Renaissance revival; but whether plain or lavish, the plan had little part in the composition. It was disguised; it was never studied as a primary part of the design. The selfishness implied in a comfortable interior concealed from view by a plain or forbidding elevation still remained when a more extravagant dress became the fashion; but the less austere style expressed the internal conditions with more honesty.

The evolution of the domestic plan began when style was less regarded. The attention paid to the revivals of Greek, Roman, Italian, Gothic was new turned to the design of buildings that were to be made convenient and useful before anything else. The new houses, and even lodges that were once replicas of palaces and temples, began to be designed on rational principles. The increasing demand for small dwelling-houses and cottages for the poorer classes created an interest in planning which began to form a subject for instruction amongst the professional classes. Architects, almost always about plan, the subject only being referred to in describing ancient buildings and Roman villas. After domestic work, the new requirements of municipalities for various buildings opened a wide field for planning; the scientific investigations and treatment of disease, hygienic principles applied to schools, workhouses, hospitals, and similar institutions have placed the planning of these buildings on a new basis, and have led to a more scientific study of the subject, based on well-ascertained facts and experiments. Many architects have devoted special study to these structures, and have completely revolutionised the old system of accommodating pupils, patients, paupers, or the working classes. Certain established principles of arrangement have been followed, as the separation of classes of patients, and of school-children, isolation of acute cases, provision of cubic space for each ward bed, ventilation, &c. The pavilion system of planning wards of hospitals with a central block for administration has been the result in one case, the central hall and classrooms for each class in the other.

We here confine our attention to two or three common kinds of buildings in which the development of plan has been evident, and first we take the modern dwelling-house. Use and comfort rather than style have resulted in the prominence of plan. Our leading architects of the Queen Anne and Later English domestic schools have been pioneers in this movement. They have made plan the motive of their work. We can refer to the earlier houses designed by Mr. Norman Shaw as examples. A new note was struck in his work. It was that of domestic convenience and comfort, with a certain desire for irregularity, quaintness,

and surprise. How unlike the house of the preceding generation! The aim of our architects of domestic buildings had been regularity, symmetry, and display. The square plan was common. Vestibules, ante-rooms, or suite arrangements, a central hall and staircase between sets of rooms, were general—a style of plan that at present is found only in houses designed by builders. To make the rooms conform to a symmetrical order they are made too large or too high. Sometimes the proportions are bad, all to fit a preconceived elevation. Such plans can be seen in the residences built fifty years ago or more in suburbs like Clapham Park, Regent's Park, and Bayswater. There was a certain stately appearance in some of these houses. They were commodious, often handsome; but they lacked those elements of domesticity and comfort that are valued by the Englishman. The new and more comfortable houses of the last decade or so exhibit complete change. The principle of adapting the plan to the family and to English habits has been recognised. The house plan of the "forties" and "fifties" was chiefly evolved from the Italian or French model, and our architects have now reverted to the English model of the 17th century; to the old vernacular type of house we see in the manor houses and other residences of the country gentry which in their turn had descended from the days of the Tudors. Exponents of this vernacular type of house are numerous, and it is almost needless to refer to such names as R. C. Ashurst, Messrs. George and Peto, J. H. Seller, C. H. Quennell, and other well-known architects to show that domestic planning is now made a study, and that the conventional types of half a century ago are out of date. A central hall large enough to be used as a family room is a feature in some of these plans, and other rooms are reduced in size or made subordinate. One mistake of the smaller dwelling-house of the suburbs is to make it a miniature mansion, with its drawing-room, dining-room, study, and suite of offices; but this is a sort of plan that has had its day, and a more rational plan of domestic planning is gradually being introduced. The subject also has been of late treated historically. Mr. Gough, in his "Early Renaissance Architecture in England," describes the development of the house plan from 1400 to 1635—a period of about two centuries. The hall was, of course, the leading feature of the plan in the earlier times: it was the common sleeping-room and banquet-room, as at Penshurst Place. Gradually it assumed smaller proportions, or was made the withdrawing-room, as we find in Elizabethan mansions. That the hall idea is being introduced again for the smaller kind of dwelling is instructive. Again the domestic development of plan has influenced style. Houses exhibit externally their interior arrangement to a larger degree than was possible a few years ago. There is even an attempt to exaggerate irregularity and quaintness. Plan has been made correlative with the external architecture, and it is this fact we have to note.

Going into details, we find the architect of to-day more studious of questions about site, aspect and prospect, the influence of sunshine upon the house, the relation of doorways and windows and fireplaces; the dining-room is studied in relation to the table, the sideboard, and chairs, and their position, to insure the necessary space for servants and guests; the library is planned in reference to the light, bookcases, and chairs; the billiard-room is considered in connection with its initial unit, the table, 12ft. by 6ft., and a space, say, of 6ft. all round it, the ceiling light, &c.; the bedrooms are planned with regard to the bedstead and its furniture; and the same scientific arrangement is shown in other rooms of the house. In every plan worthy of the name the main unit is made the key-note, and the individual occupant is considered. We find, indeed, the individual

is more careful for than was possible in the older system. From the fact-basis of the absolute requirements of modern life the modern plan has been evolved, and has found external expression. It is no longer the elevation that determines plan, but plan which determines the external form. The process has, in fact, been just the reverse of that followed a century ago: the development is now from within outwards. Though the desire for picturesque, or irregularity, or quaintness has influenced both plan and exterior, it is more honest than the attempt to suppress the interior requirements by the rigid forms of classic symmetry. Our later houses have shown a quieter treatment, almost to the other extreme by exaggeration, as we see in those close-trimmed, high-tiled roofs over plain white stucco or rough-cast, imitating the plain country cottages of the 18th century. In many country and suburban localities we notice the increasing number of houses of this class, and they are eminently pleasing and picturesque amidst country surroundings.

A modern department of house-planning comprises dwellings or flats for the working classes, and the handicrafts, which have encouraged economic principles and compactness in arrangement. A flat with two, four, or more sets of rooms, accessible from one landing, is a problem that has exercised ingenuity and scientific planning, and as types we can refer to the examples of dwellings designed and erected by the London County Council, the Peabody Trustees, and other well-known associations for providing dwellings in London; also the excellent dwellings erected by the corporations of Liverpool, Manchester, and Glasgow. The planning of a complete suite of rooms on one floor requires a knowledge of the everyday life and wants of the class for whom it is wanted. The science of planning has in this direction exhibited a conflict with the old rule to make the plan suit the external design; but the repetition of the same order of rooms on every floor makes it impossible to produce a varied elevation. A large class of planning has been developed by the increase of our great cities, which has brought with it the demand for hotels, clubs, and flats. The accommodation of the individual rather than family life is being encouraged, and this has had an effect on the art of planning. It is a new problem, for it seeks to provide for the individual and his social life.

The evolution of church-planning has been quite as much marked during the last half-century. We see it in an approach to greater simplicity of plan, dispensing with projecting transepts; a rectangular area divided into nave, aisles, and a chancel deeper and more in accord with ritual requirements. Comparing the plans of churches built forty years ago by a past generation of architects with those of to-day, we notice a change; the nave and chancel of the same width and height, transepts included within the lines of the aisles; and these buildings are accompanied by plainness of exterior, avoidance of unseemly and costly towers and spires, and better accommodation for large congregations in crowded districts. The chancels have followed the demands for choral offices. Compare, for instance, the ornate structures erected during the Gothic Revival, or the late Sir Gilbert Scott's earlier churches, with those erected by Mr. Pearson or Mr. Brooks. In the former the structures were based on cathedral or collegiate church types, and had central towers and spires, stone details, and were of much cost and pretension in the design; in the latter, plain brick structures of some loftiness are seen, with perhaps only a *fiche* to break the ridge. The lamented death of Mr. Jas. Brooks recalls this marked divergence in plan and design, as instanced in such of his churches as St. Columba's, Kingsland-road, St. Chad's, Haggerston,

and Holy Innocents', Hammersmith, a list of which we published in last week's BUILDING NEWS. His earlier style was too severe to be popular, but it was dignified, and well suited to large crowded districts.

For congregational uses we have also a development of plan that adapts itself to preaching, in which a wide, almost aisleless, nave, or plan based on the hall type, has been adopted with singular success, as in Dr. Allen's Church at Islington; Christ Church, Westminster Bridge-road; and several designed by Mr. Jas. Cubitt. These buildings give a large concentrated area within sight and sound of the preacher, while the adjuncts for baptisms, purposes, like chancels and transepts, have been reduced or dispensed with. These two extreme developments of church-planning—one for sacramental and ritual requirements, and the other for preaching and acoustical properties, have resulted in the design of buildings of a more national and expressive character than any of those built forty years ago which were mere imitations of Medieval or elaborate cathedral arrangements.

Our schools illustrate another remarkable development, the scientific hygiene applied to educational requirements has transformed the design of our schools. A central hall and its surrounding classrooms has developed a type of plan well known—an arrangement that has followed the principle of keeping the classes separate. External architecture has here also been made to conform to the plan in a manner that would have astonished the older school-builders; but the central hall can be made a feature. We have no space left to take particular instances of plan development, but from these remarks it will be noticed that the subject is instructive and interesting as an architectural study.

THE KEW COWL TESTS.

Nearly twenty-five years ago we published the results of some experiments made at Kew upon ventilating-cowls. These tests satisfied very few people, as the conditions under which they were made were very imperfect—so much so that the *Times* even declared them to be valueless, as they did not indicate in any satisfactory manner the extracting power of the ventilators. Indeed, the writer in that journal said: "Neither in the case of either of the cowls nor the tubes was their true value as extractors ascertained." We have now a report on the results of the continuation of these tests, which appear to repeat the unsatisfactory mode of testing and the faulty experiments. Those who initiated and carried on the tests have all died, and their fragmentary experiments and tabular results have been published, but on not very scientific bases. The lapse of time has rendered most of the cowls and terminals obsolete, and beyond this the improvements and modifications that have been made in ventilators have been ignored. Since the early Kew experiments a new era of ventilation has opened. The more eminent of our ventilating engineers and specialists have introduced important improvements in the form of cowls and terminals for assisting up-draught and down-cast currents under various conditions suitable for buildings of all kinds. These have undergone modifications in construction, and a corresponding degree of scientific data are necessary for accurately determining their action, which the present report does not supply, as it does not deal with these improved ventilators.

Let us recall a few facts bearing upon the subject. On Sept. 27, 1876, we published the results of experiments made at Kew upon ventilating-cowls. Our readers may remember the impression made at the time referred to. The report of the tests also appeared in the *Times*, when the method of testing and the results, as we have

already said, were declared to be valueless. They were an elaborate series of about one hundred experiments made in seven days, and under different conditions of wind and temperature. The report was before us on the subject, by a committee appointed by the Sanitary Institute of Great Britain to test ventilating exhaust cowls. Does not seem, as we have said, to give us any more satisfactory information of a practical kind. A large portion of the report as given in the *Journal* of the Sanitary Institute (which has been compiled by Mr. W. N. Shaw at the request of the Council of that Institution, owing to the death of Mr. Rogers Field, the last survivor of the Cowl Committee), deals with the methods of testing—a most important subject, and still unsatisfactory—and the correction of air-meters, together with a vast deal of matter of little interest to anybody except the experimentalists themselves. The facts and information are, in fact, too fragmentary to be of any practical value, and it is acknowledged, indeed, "that the want of agreement of the readings of the different instruments caused some hesitation about accepting a final value. It is impossible to go through the mass of diagrams and give a summary of this report. Mr. Shaw's preface to the report appears to throw some doubt upon the result of the experiments. For example, the word "efficiency" for a terminal or cowl is only intended for a numerical constant or factor, which is characteristic of the cowl and of that alone. The mode of testing by the method of averages of a large number of experiments is also referred to by the editor as unreliable, and it is admitted that an element of "probable error" is sure to be introduced. It is admitted in the preface that the "ratios obtained by the Cowl Committee depend upon the other part of the experimental arrangement, and not upon the terminal portion only"; but this admission seems to us to invalidate the conclusion arrived at with regard to the relative exhausting power of cowls. Further, it is impossible to ignore the seriousness of such admissions as these:—

"It will be well to consider briefly the conditions governing the flow of air up a pipe under circumstances which are not ideal, and which may be regarded as the effect of a cowl or terminal cannot usually be regarded as being completely dealt with by a single factor, or series of factors, representing either a single set of conditions, as to the direction and force of the wind under which the flow takes place" (p. 340).

"The numbers so obtained for ratios of flow will accordingly not give anything which can be regarded as a 'constant' for the cowl, or which will serve to identify the effect which the cowl would produce in the way of alteration of aerodynamic force, or alteration of resistance in circumstances slightly different. The numerical result is, in fact, due to the special combination of circumstances, and could not be reproduced unless the circumstances were themselves approximately reproduced" (p. 341).

"The numbers obtained for the ratio of the flow above the cowl, to the flow in the pipe, are not, as it is to be noted, that can be regarded as a constant for the cowl, and consequently the use of the term 'efficiency' to denote the ratios obtained is inappropriate" (p. 344).

Surely these statements constitute an almost direct acknowledgment by Professor Shaw that the inconsistency of the test to demonstrate the relative values of either cowls or the open pipe. It must also be always remembered that the diagrams of the cowls show many old and obsolete types, and do not include the more improved forms of the present day.

The fragmentary and complicated character of the report preclude us from entering into the various tests and the tabular statements and diagrams furnished. Three types were examined of open tubes, the "up-cast," "down draught," and "injector," but the large majority of tests consisted of up-cast experiments, which were of three kinds—open tubes, and terminals. The "cowl" is contrivance for automatically producing or improving the flow of air in a pipe, the "terminal" is a name given to any slight modification of the shape of orifice of a pipe for experimental purposes. The experiments made at the Old Deer Park extended to about 9,000. In the cowl experiments the

owl was fixed on the central one of three pipes, the two outer ones being left plain open pipes, and this order was followed in the case of the "terminal" experiments. In the introductory note on the efficiency of cowls and terminals, the writer acknowledges the complexity of the conditions. But we do not enter into the theory here: we confine our attention to the general results of these tests. Till a thoroughly reliable and accurate system of testing is applied we are not prepared to take the results recorded. We should also like to know whether it is true that the cowl or terminal which—owing to the method of construction—develops the least resistance is the most efficient, and which is simply a modification of the open pipe, offering the least resistance to the internal air pressure up the pipe, belongs to the Institute, and if it holds patent for it? Several pages of the report and the tabular reproduction of results are furnished, including rough sketches of smoke experiments on terminals of different kinds. The conclusion is that "a 3in. pipe results for a 9in. rain-gauge cap, 1½in. above, a 5½in. by 6in. louvre, 3in. deep, flanged for protection against down-draught, showed an efficiency of 133 as compared with an open pipe result of 100. This is said to be the best up-cast efficiency against a 3in. pipe, but the committee and the reporter, it is stated, the average of 31 experiments tried on eight different days." The asserted efficiency of this terminal would have been more satisfying if a committee of experts representing the makers of terminals and cowls had been present and testified to the method of testing adopted.

Several objections as to the conditions under which these pipes were tested ought to be answered. Thus the open pipe up-cast depends on a variety of elements—size, length, temperature, direction of wind, and other points. Have these been considered by the experts? We understand that the committee desired to observe the results of these experiments to insure the results were pointed out, but that none of them have been carried out. The conditions adopted appear to have favoured the open pipe, such as the one said to be the most efficient. It is well known, for instance, that certain types of terminals act most efficiently when of a small size or diameter, and less effectively in the larger sizes; it is also of importance, to insure correct results, the relation of the cowls and their position with the wind, and the nature of obstructions, and the air inlet should be noted; that the tests should include not merely certain types of ventilators, but all modifications of these types; and it would be obviously unfair, for these reasons, to take one of these modified ventilators as a test, and to exclude all the others. Again, it is to be noticed that the exhausting power of the various forms of ventilator is not so great in the smaller sizes as in the larger sizes, and therefore, if any correct results are to be obtained, the exhausting power is to be ascertained, the larger-sized ventilator should be selected for the test. Are we sure that the committee who have reported the results of their tests have taken all the modified forms of ventilators now on the market into account, or their tabulated results refer only to a few types which may become obsolete? If so, we cannot attach much importance to the results. These are questions that should be asked by all manufacturers of these appliances, as well as by the public, who wish to select the best ventilators. The exclusion of the makers of cowls from these tests is to be regretted. In fairness only to the makers, the committee might have accorded this favour, and each inventor could have seen the conditions under which in fixing his own cowl were observed, and such concession would have added to the value of the results, and relative test of efficiency. The Kew tests, however interesting as exhibiting much abstruse research, will possess little scientific

value, except as recording results of experiments on particular tubes and cowls, fixed and tested under certain conditions of observation and weather. On all questions relating to currents of air through tubes the most subtle distinctions are necessary, to be able to record a set of numerical values such as are here set forward. These must have relations not only to the size, length of pipe, terminal, direction of wind, and temperature, but also to the actual building or room to which the ventilator is attached. It appears to us these tests, careful and elaborate as they seem to be, will not satisfy the architect who wants to know practically whether a certain ventilating terminal or cowl will act in a desired manner in a particular building or situation.

THE LONDON SKETCH CLUB.

THE exhibition of drawings and sketches by the members of the London Sketch Club at the Modern Gallery, 175, Bond-street, is not quite so strong as the last year's show, but there is enough to arouse the susceptible abilities of many who have broken through the trammels of conventional work and desire to see what a gifted pencil and brush can do without restraint in the use of colour. The most notable work in the work of Giffard H. Lefevestre, as in the "Storm" sketch at Southam. The head of "A Spanish Shepherd" (3), by Tom Browne, is strong and clever. We notice also "Volendam Boy Fishing," a simple and broad sketch, "Mill, Etaples" (19), and one or two more subjects from his vigorous brush. George C. Haite has a Dutch Canal, "On the Broods," Cornhill (83), and several studies of pleasing tone. Hanks has other subjects, chiefly studies of Cornish Fishertalk in his own inimitable and æsthetic style. We note especially "A Sketch," "Entrance to a Fish Market" (41), and "Mutual Support" (58), a study of father and little daughter. Dudley Hardy has some st. on colour in his Adriatic sketch (17). His most important subject is "Home," a fisherman and his wife on a quay, treated with much freshness and power, and a study of a pitifully poor fishwife, "The Last Load" (100), "Outward Bound," and other subjects are vigorously handled. The subjects contributed by John Hassall, as (30) "If Wishes were Horses, Beggars would Ride" and "The White Dole" (132), are in his usual vein of humour. Hal Hurst sends several clever sketches, as "Firelight Fancies" (101), and we notice several semi-comical sketches by "The Shaving Time," and the study of Charing Cross Underground Station, by René Ball, and sketches by Cecil W. Quinell, and others.

The rivers committee of the Manchester Corporation have prepared a report of their work during the past year. The net cost, exclusive of interest and repayment of capital, has been £18,431. While emphasising the necessity for care in the construction and management of purification works, the committee affirm that the results of their labours have been very satisfactory, and are pointing out the scheme for the bacterial treatment of sewage.

A statue of Prince Albrecht, brother of the Emperor William the Great, erected opposite the Castle of Charlottenburg, was unveiled on Monday in the presence of the Emperor William.

A Local Government Board inquiry was held on Thursday in last week at the Court House, Gravesend, by Mr. H. Percy Boulnois, M.Inst.C.E., into the application of the town council for permission to borrow £31,500 for plant, &c., for supplying electrical energy, and £3,500 for the provision of a refuse destructor. Mr. Hatten, town clerk, and Mr. W. H. Trentham, electrical engineer, made a statement of the purposes for which the money was required and submitted plans of the buildings.

Colonel Luard has held an inquiry at St. Annes-on-Sea into the application of the council for the sanction of the Local Government Board to borrow £7,230 for electric supply purposes, and £1,525 for sewerage.

The West Ham Board of Guardians is said to be the first local authority to provide for the health as well as for the fair payment of workmen in dangerous trades. It has just entered into new contracts for earthenware, and has made it a condition of contract, in order to guard against lead poisoning, that only goods made with leadless glazes shall be provided.

THE ARCHITECTURAL ASSOCIATION.

THE fifty-fifth session of the Architectural Association was inaugurated on Friday evening last, when the meeting hall of the Royal Institute of British Architects was crowded by members desirous of greeting and hearing their re-elected president, Mr. W. Howard Seth-Smith, F.R.I.B.A., and of witnessing the distribution of prizes awarded for work done in the past session.

The proceedings were opened by Mr. E. W. MONTROSE, past-president, who moved the adoption of the committee's report and balance sheet for the session of 1900-1—summarised in our issue of Sept. 15, p. 343. Mr. MONTROSE said he was happy to be able for the first time to congratulate the members on the fact that the accounts showed an excess of income over expenditure. The surplus of £500 carried forward was especially desirable and acceptable just now. He hoped the main and the only source of income would have been increased by over £200 if all members had paid up their subscriptions, as should be the case, and he hoped this would be borne in mind next year by members.

Mr. F. T. BAGGALLAY, past-president, seconded the motion, which was unanimously carried.

THE PRESIDENT proposed a vote of thanks to the Council of the R.I.B.A., for its tenth annual grant towards the cost of the educational work of the Association, financial aid which had been so useful and so generous. The President also proposed a vote of thanks to the donors of the books which they had called for who were about to be made on their respective floors during the ensuing session, owing to the approaching opening of the newly-established Day School. THE PRESIDENT also proposed a vote of thanks to Mrs. Arthur Cates, who had presented to the library a valuable collection of books, bequeathed by her late husband, and who had been the subject of the eulogistic eulogy was one of the best ever received by the Association, and it had been intimated to him that, as they did not at present possess shelving accommodation for this addition to their books, Mrs. Cates intended to give the Association a handsome bookcase. THE PRESIDENT further proposed that a vote of condolence be passed to Mrs. Cates and family on the death of their old member, Mr. James Brooks, whose work was thoroughly English and thoroughly good.

These resolutions were unanimously agreed to. Mr. F. R. Herring and Mr. F. H. Swinyard were elected as members, and 51 nominations will come up for ratification at the next ordinary meeting.

Mr. R. S. BALFOUR, hon. sec., proposed a vote of thanks to Mrs. J. M. Brydon and other donors to the library, also to Mr. Edmund Sharpe and his brothers and sisters, who, through Mr. R. Phené Spiers, had presented the collection of architectural diagrams belonging to their father, the late Mr. Edmund Sharpe, for use in the Day School.

Mr. H. P. G. MAULE, hon. sec., read letters of regret at non-attendance from Mr. W. Emerson, P.R.I.B.A., and Mr. G. H. Fellowes-Prynn, past president of the Association; and Mr. BALFOUR announced that the Day School would open on Monday morning, the 14th inst., at 9.30, and the evening classes on the same day, both at 56, Great Marlborough-street, W.

THE STUDENTSHIPS, PRIZES, AND MEDALS

gained during last session were then presented by the President, in accordance with the list of awards published by us on the 13th ult., p. 344.

The PRESIDENT then delivered his

OPENING ADDRESS.

As we are so remarked, an eminently businesslike society, I propose this year to be directly practical, reviewing our recent work and sketching what I conceive to be the policy of the A.A. in the immediate future. The past session has been one of unparalleled activity. It has been a session that has sustained by death, which has claimed eight of our members in the twelve months. But some men there are whose passing leaves a great void, alters in fact for a time the whole complexion of things. Such men were John McKean, Dr. Fry, and Dr. C. C. Jones, who recently, the last was not a member, but all were warm supporters of our work. We can pay them no higher tribute than to say they possessed that admiration and trust to which their professional attainments as well as their personal qualities were entitled. Dr. Fry was especially one of those who win all hearts. By his death many of us have lost a dear friend. Mr. Cates

became a member in 1847, and was hon. secretary in 1862 and 1863. He has been interested in this Association covers more than half a century, and that interest was as direct and influential at the end as in the beginning, for at the time of his death he was a most active member of both the Education and the Premises Committees.

SUCCESS HAS ATTENDED ALL DEPARTMENTS

of our work. We have added 116 new names to our membership roll, besides reinstating six others, and our financial report at the close of the year has been a best as record. The Sketch Book, which for 35 years has figured so largely in connection with the work of this Association, but has been hitherto run by an independent committee, with Messrs. William G. B. Lewis, and William A. Pile, as editors, and Mr. Edgar H. Solly as treasurer and secretary, has, at the request of those gentlemen, been taken over by the general committee. In recording our debt of gratitude to those who have conducted it so long and so ably, and whose services we are fortunate enough to retain for the most part, you will agree that under the direct control of the general committee such a periodical ought to become a very valuable property. May I urge members to endorse the committee's action by supporting it, either as authors of plates or as subscribers? The past history of this Association is

A HISTORY OF EDUCATION.

In accordance with its traditions we have, during the session just closed, tried to meet the demands of the profession and of the public for better education as to the general principles which should be ascertained by a careful review of art feeling in the community, and the growing sense in the profession that with us lies in great measure the responsibility for raising public taste in building. This sense of the beautiful can only grow as it is nurtured by clarifying the objects of beauty it is our function to create. You have, after mature consideration, added to the curricula a Day School, and with its opening next week we enter upon a course entailing increased responsibility upon this Association. You are probably all conversant with the general principles upon which this school is the one to be recommended, namely, that if a young man is not to waste his employer's and his own time, it cannot possibly be a good thing that he should be plunged into a busy office without some preliminary training. It is difficult to imagine on what grounds such a principle can be objected to. No one is to be entering upon the services of Mr. Arthur Bolton as head master of this school. In his hands it is sure to grow and prosper, as the evening studio has done under Mr. Lewis's direction. We feel satisfied it will receive the encouragement of the profession. Success depends on this. I would urge young men whose bent is towards architecture to enter this school, either directly or by agreement with the principals to whom they may wish to be articulated. I believe most principals of standing will be found willing to give such pupils as may be unable to attend the evening schools facilities for attendance, if not regularly, at any rate for two or three terms at stated hours for certain courses they particularly need. Such an arrangement will be as advantageous to them as to their pupils, while those whose minds are not fully committed to this line of life will, by entering the school, have an opportunity of considering their decision in the light of experience. In no better way than by mingling socially and educationally as they do here with a body of enthusiastic fellow students and practising architects can one become enamoured of the highest excellence. Nor, indeed, can they ascertain their own true level except by thus comparing themselves with those less, or more, gifted. All this gives a unique value to our Association as a training-ground: and more than this, the control and direction of this line of life will, in the hands of an executive representative of the proportion, the enthusiasm and aspiration of the youth of the profession not less than the experience of men who have seen considerable practice. Our list of visitors to the School of Design shows that the best London artists are giving their valuable time in teaching us while our new advisory council contains the names of nearly all the architect members of the Royal Academies of the United Kingdom.

FIRST AND FOREMOST, NO CHAMING.

A word here to our students in both evening and day schools. The committee too often observe a desire to go for the R.I.B.A. examina-

tion after only a few months' direct preparation. This means champing, champing means working at high pressure, and high-pressure, as surely as a neglected education, spells failure: not perhaps in passing the formal test, but in practical success in after life, which every student will admit is the real goal of professional education, though he may not have grasped the logical conclusion of that admission. The A.A. will, I hope, never be a party to this sort of thing. You must go elsewhere if you want it. It is not education at all. Passing the examination will make a man neither a skilled draughtsman nor a good builder; but if he grasps the essentials his success is assured, and they can only be attained by a long and patient course of study, systematised as carefully as it has been by this Association. Above all things believe that no system, however complete, can teach you architecture, at its best it can but provide conditions suited to work, and teach you where and how to learn. Your education—*viz.*, your mental development—will be the result of your effort to apply the information offered and to work it out for yourselves. If the diploma (membership) is sought merely as a general certificate's assurance to the world that you have had such a systematic training, as a guide to the subjects which it is necessary to know, and as an incentive to work at them, surely nothing but good can come of the exhortation which qualifies for the diploma. Let Emerson's testimony to our national character, written fifty years ago, inspire us to-day. In England, he says, "Every man is trained to some one art or detail, and aims at perfection in that; not content unless he has something in him that surpasses all other men. He would rather do one thing at all than do nothing at all. I suppose no other people have such thoroughness."

GENERAL TRAINING MUST PRECEDE SPECIALISATION.

As our art has a technical basis, this Association, if it is to become the educational power it aims to be, must act upon the universally admitted dictum so well expressed recently by Mr. John Lubbock, that "specialisation cannot possibly be assimilated by a student unless a proper foundation has previously been laid by a thorough grounding in elementary and secondary instruction. Surely this is also true of art. The more thorough an artist's general education, the more intelligent will his mind in all directions, and the more rapidly he will appropriate and assimilate the special knowledge needed to fit him for his chosen life-work. I therefore hope that the committee will before long see their way to make admission to this day-school conditional upon passing the R.I.B.A. preliminary examination or its exempting qualifications. And what is true of a broad grounding in general education in youth is equally true of early professional training. You must not specialise until you have some knowledge of every subject essential to the practice of every ordinary architect. The Association has been most careful not to introduce into its curricula any subject which does not come under this category. We might just as reasonably continue to educate our youth in the art of adapting to the conditions of Metropolitan water supply in the good old wooden pipes we have just removed from the adjoining street. Perhaps the most striking contribution during the past year to the discussion of this great question was Professor W. R. Lethaby's paper read before the R.I.B.A. entitled "Education in Building." It is an able history of the conditions under which architecture was carried on in the Middle Ages and up to the time of the Renaissance. It exhorts us by every means within our reach to encourage a high standard of practical excellence on the part of our executants (the British workmen) and to see to it that they are not under the control of a "magister" who designed and commanded, but that we endeavour to bring about a more co-operative spirit as between architect, builder, and mechanic. I hope all will read his delightful paper. But even supposing that the architects of these times were not under the control of a "magister" who designed and commanded, but that the creation of an "operator ipse magister," as contended by Mr. Lethaby, he appears to us to underrate the effects of the vast social and educational change the whole community has undergone since the time of the Middle Ages, and the impossibility of adjusting the old customs to modern requirements. Then it was only the King, the clergy, and the nobility who

were patrons of the building art. We now have a very numerous and educated upper middle class who can afford to build. Their travelling and knowledge makes them critics in the matter of art, and anxious to imitate the ancient work they have seen. All this has resulted in a demand that those they employ to design and direct their projects should be men of greater knowledge than more than they themselves do of the history and structure of these admirable works of old; and shall build with an approximation to the same feeling; shall, in fact, be scientific where they are dilettante.

PROFESSIONALISM

is the expression of this demand for a high standard of training. "Professional men," including those whose function is design and draughtsmanship, have come to stay. They form a large section of the upper middle class, and they are largely employed, not only by those of their own and of higher social status, but also by the numerous bodies representative of all classes alike, who prefer to be advised (in carrying out complicated architectural problems unknown to Medievalists) by men who have been thoroughly trained, through long years and at great cost, in the art of planning and in the knowledge of building construction, rather than by mechanics, whose blunders, inevitable where several trades are working without a general superintendent, would not be tolerated in these days of scientific method and exactitude. It is a fault in our training that our pupils are not on the one hand enough, and that we do not specialise enough. Highly-trained men, with a diploma from a guild or an institute or what not, ought really, if our building is to be of our best, to confine ourselves to design and the supervision of building construction, and not to meddle with surveying, valuations, and dilapidations bills, &c., work which certainly does not savour of art. When, as a profession, we are more thoroughly trained, and when our occupation has obtained legal protection from the competition of unqualified persons, we shall be in a position to adopt more generally this higher standard of training. When, as a profession, these conditions is established the first will naturally follow, and the public will employ us more generally. The absolute necessity of some

PROTECTION OF THE TITLE OF "ARCHITECT"

and its confinement to duly trained men is being more widely for every year. In addition to the striking animosity of Continental professional opinion which I mentioned a twelve-month ago, we now have the weighty and closely-reasoned pronouncement of the President of the Institute in favour of something of the kind. A law has just been passed in California with this purpose, and I am sure that the majority of the provincial professional opinions in this kingdom is in favour of it. The Institute's policy, moreover, since the establishment of the examinations, is incomprehensible and illogical, excepting as based on this principle. After all, the proposal is only that the State should give us a legal recognition right to the expensively-acquired skill and knowledge which it demands in the same spirit as it did to the Medieval Guilds, but in the manner dictated by the political and social conditions of to-day. If this Association is not to experience a serious check in its useful career, we must apply ourselves heart and soul to settling the vexed question of

NEW PREMISES.

This may be done without undue labour if we all put our shoulders to the wheel, and not otherwise. I need not utter a word to you as to the urgent need for extension. We have completely outgrown our accommodation, and shall go on wanting more and more as the year goes on. We are in need of finding a site in round spaces until we can find suitable and sufficient room elsewhere. You will recollect that after many years' search for premises adaptable to our wants we abandoned the effort as impracticable, and for the last twelve months or more we have been endeavouring to find a site to finding a site suitable for erecting a building such as we want. One such came before us this last summer, but it would have involved a capital expenditure of at least £18,000 (including the premium for existing lease); and as the possibility of ascertaining how much we could collect towards this before it was necessary to close with the offer convinced the committee that there was no other course than to make an appeal for funds this autumn and thus

we prepared to take up the next suitable site as we may come before us. Freehold we are unlikely to be able to get, even if we could raise capital enough. Ground rent, with rates and taxes, repairs and insurance added, are all we can at present afford to pay out of annual income. The whole cost of building and equipment, and other expenses, a sum amounting (according to the two last building schemes gone into by the Premises Committee) to at least £15,000. This estimate allows nothing for luxury, but would provide merely a simple and comfortable abode. The Committee believe they already see their way to something like £3,000 within the next three years, including specific promises they have received. If every member of the Association would kindly undertake to collect (not necessarily to give) at least a guinea this Session (and the next) for the cause, without any help, to the extent of about £5,000; a satisfactory guarantee of our enthusiasm and determination to have premises worthy of the work we are doing. It is, after all, the public more than the profession who will benefit by this encouragement of architecture in London, and we need not be shy in asking for aid from our friends in other parts of the cause. When technical education is being so well advanced by private and public liberality, art surely may claim its due share. Supposing our anticipations are realised so far, there ought to be no great difficulty in raising another £3,000 from outside sources. Within the present year, at least £10,000, we might go forward in anticipation that a scheme so well inaugurated would be the best further appeal to the liberality of the profession and lovers of our art, and we might then reasonably expect to open our building free of debt within three years from the present date. You will be glad to hear that the Oxford architect, Mr. Thomas Lawrence, offers his cartoons by Raphael and Michael Angelo to the Oxford University for £7,000. The offer was accepted, and the committee, after collecting £3,000, called on Lord Eldon asking for £100. He put his name down for £3,000. They told him they could easily collect the rest, and he said, "I will give you £100, and I will probably collected all they can spare. I can as well give the rest," and he wrote another cheque for the whole £4,000. There are Lord Eldons still in existence, let us hope they still retain enough interest in art to put this great educational effort on a broad basis, for who knows how many years hence, when the art and architecture of this of their prototype, they may thus bestow upon their country.

THE SLOW TRAINING OF THE ARCHITECT.

One of the greatest thinkers of the 19th century directs our attention to a point which should encourage and stimulate us as individual students as well as an Association of Architects—viz., that “in proportion to the excellence of any form of being is its progress tardy and its cycle vast.” He says:—“Compare the different faculties and feelings of the individual mind. You find them appropriate to the different schools, and the different epochs of their maturity has its season, which belongs to man in common with all other sentient beings, is the endowment of his earliest days. Memory which simply prevents experience from perishing, which furnishes language to the lips and preserves the materials of the past for future treatment by the mind, ripens next. The understanding which makes incursions and wins triumphs in the field of abstract truth is of later origin, while the great power of synthesis distinguishes all genius, which seems to sympathise with the devising spirit of the artificer of things, to apprehend by natural affinity the most subtle relations he has established; and from small and gross material to create the useful, the beautiful, the true, is the last as it is the rarest and most glorious of intellectual gifts.” Elsewhere he says:—“The great principle applies to the work created as to the mind that creates them, thus:—“As every great sentiment of the human mind shapes itself into expression in some form of art, it is fair to infer that a passion which is left no durable memorials . . . cannot have yielded any great power. In measuring the art of any people, you find the proportion of their attainments for precisely here it is that the mind transcends the body and works to the noble end of any outward need and works to the perfection that must come forth, and the deeper and more durable the feeling the less perishable are the monuments it creates. What, then, are the

remains which you can study in the land of the Cæsars or the Ptolemies? The first obvious fact is that the buildings devoted to the convenience of the body are for the most part gone, while those that represent ideas—the mint, the senate, the temple of Mars—remain for still the places of traffic, the treasuries of wealth, the home of domestic life, have crumbled into dust, . . . but the temple answering to the sense, the Infinite and Holy, the rock-hewn sepulchre where love and mystery blended and a twelfth-century monk, in the quietude of his cell, praised, grateful for services to the commonwealth: these survive the shock of war and the waste of centuries, and testify that religion, love, and honour for the good are inexhaustible. . . . Suppose the ages to be done with, and the world to be eternally buried in darkness, but its most durable remains left. . . . There are the same great monuments of our humanity repeated still. . . . but in the midst of them you discover vestiges of which Greece and Rome present no parallels. . . . Here we have a new sentiment—of the infinite worth of the individual soul, which in heathendom has left, so far as I know, not one memorial of itself, and which now vies in the solidity of its creations with the most ancient passions of the soul. . . . Examples these of the Christian sense of the infinite worth there is in man, and for what he is, though he be a slave, or for what he is: his faith that the meaneast is but the highest in germ; his vow to clear every burden from the lot, to clear every film from the mind that his poor brother seems less than a Son of God." Yet as students we chafe under the long and patient training required to make the most of our humanity, and the artists we sometimes allow our enthusiasm to suffer because national taste is so slow in developing. No one will deny that the art of the European Renaissance is a higher and nobler thing than that of the New Zealand Maoris, or assert that the intellect of the latter is more highly trained and civilisation of that people. Let it suffice that we are progressing, and that time must be allowed in proportion to the excellence of our art. To us belongs only the responsibility of doing our best by cherishing at all cost the highest ideas and cultivating our personal talents to their utmost.

Mr. BRADDOCK PRY, past-president, proposed a vote of thanks to the President for his thoughtful and encouraging address. He was struck by one remark in that paper, alluding to the students who chafe under the present long and patient training. His own experience was that there was no chafing, and they all knew that the period of training was long, but no patient student found neither delight nor pleasure in his work he had better abandon architecture and go in for the examinations of the Surveyors' Institution. Unless his eyes were opened, or his enthusiasm was awakened, the architectural pupil was to be pitied. No architect could be successful in his art, unless he had the spring of enthusiasm for his art, and the student who had the privilege of preparing untrammelled designs in a class was far happier than he could ever hope to be when working for a cantankerous client, with, it might be, a cantankerous builder executing the contract. He would urge the student to cultivate his own enthusiasm, to go to the source, that was good in his own locality, and he would then learn to look upon the commonplace work awaiting him with some enthusiasm; let him further study the work of some one great man, and ascertain the ideas which underlaid his designs. The Association might not be able to afford to educate in the old haphazard style; but it could afford to give the student a more uncommonly good work, and that this must have been due to underlying enthusiasm. The stimulation of enthusiasm was the principal use and object of the Association in training the men who laboured in miserable offices under good men who did bad work. Finally, he would remind them that the Association was not a mere club, but an indurabler, and that the work he rubbed out led on to the execution of his best design.

Mr. FRANCIS G. F. HOOPER seconded the vote of thanks, and referred to the stimulus students received from working in the Association's classes and in attending its meetings.

The motion, having been carried by acclamation, was briefly acknowledged by the President, who observed that he had not intended to deprecate enthusiasm in art students. He had known very clever students turn out absolutely impracticable and unworkable designs, and he wished to caution

young members against this danger. The generality of students, as they knew only too well, were not geniuses, and, therefore, the aim must be to train each worker systematically and thoroughly.

MANCHESTER SOCIETY OF ARCHITECTS.

THE President of this Society (Mr. Alfred Darbyshire) delivered his address at the opening meeting of the session, held on Friday night at the rooms of the Society in King-street, Manchester. He reviewed the condition of the art of the architect and its practice at this, the second half of the nineteenth century, and with that in the early part of the Victorian era. He spoke of the difficulties that presented themselves to the man who elected to become an architect 40 or 50 years ago. It was an age of Classicism at war with the Gothic revival. The men then practising architecture in Manchester were of two classes, the "Five Orders" and the Classic imitators. They were turned on to the "Five Orders" which formed the basis of the private and public architecture of this district; there were no technical schools and no methods of teaching beyond the curriculum of the office. A time arrived, however, when the limited education of the architect was no longer sufficient, and the School of Art; the Academy of Fine Arts was established. In addition to these extra means of study the Gothic revival set in, and captivated them with its fascinating influence. He next considered what had brought about its present state of prosperity and the conditions which were to be praised. There appeared to be two marked and important causes for the change in architectural practice. The first of these causes was the determination on the part of architects to throw off the shackles of severe classicism and the tyranny of the Five Orders. The second cause was the opening up of opportunities for study outside the office walls. Schools of art were established, and the architect learned to become an artist. There were, too, public libraries, and the student became a scholar, and made himself acquainted with the various phases of development in the history of architecture. He next pointed out the various causes which struck the death-blow to the old school, which attempted to adapt Greek temples to town-halls, Quaker meeting-houses, concert-halls, and infirmaries. He supposed there was scarcely to be found a building where the whole character of a town had been so completely changed for the better by the genius of one man. It was true that Ambrose Poynter had built his National and Provincial Bank in Moseley-street, with its beautiful Italian facade; now the property and the house of the architect were in the hands of the State, and the corner of St. Ann's-square; but Walters inaugurated a new era in the civic architecture of Manchester. Mr. Darbyshire afterwards pointed out some of the defects which had arisen, perhaps as natural consequences, in the practice of prescribing large architectural monuments to the public, and of general competition, and with a larger market of architectural practitioners the general public was apt to treat its relationship with the profession from a commercial point of view. Any sympathy with sentimental conditions which might have existed in bygone years had wholly disappeared. The architect's building had to be satisfactory or enlarged, although recognised as a satisfactory work, and its author still living, the work was given to a stranger. Again, it was the custom in times past when any work of consequence requiring special knowledge had to be realised, to consist of a small number of competitors, and the result adjudicated by a thoroughly competent and honourable architect; the system would remain incomplete and a second



Stables, Locock, Wilts (1540-1553).



Cottage, Steventon, Berks.

He spoke of the decision of the Corporation of Manchester to establish a municipal office of architecture, to be presided over by an official to be styled "the city architect." What sort of a man, he asked, was to hold the office, and with what powers was he to be invested? Would the city architect decide the future artistic development of architecture in the city, in addition to the technical points which might arise in the future? If the answer was in the affirmative it would be evident even to the non-professional mind that the acceptance of such a responsibility involved the appointment of a man of high culture and great artistic knowledge. Or did the contemplated appointment involve the designing of all public buildings and edifices under the control of the corporation? If such should be the case the profession would suffer materially. He ventured, however, to think that a result of this kind was not contemplated. He appreciated the desire of the corporation to appoint a city architect, and would have him invested with power to condemn all ugliness and purely commercial street architecture; but it would be undesirable to place the future architecture of the city entirely in his hands. Another matter of great importance to the local profession required careful consideration. He alluded to the establishment of a Chair of Architecture at Owens College. A Joint Committee of the Society and the College had been appointed to take this matter into full consideration. A set of resolutions had been drawn up by the committee which explained the object of this important movement. In them it was pointed out that it is desirable to establish in Manchester a school of architecture on the same general lines as those of the Liverpool School of Architecture and Applied Art; that to give effect to this object there should be a Chair of Architecture in the Owens College, with arrangements under which adequate preparation could be given for the existing Honours School of Architecture in the Faculty of Arts of the Victoria University; that in order to provide for a complete school of architecture it was essential that there should be co-operation between the city, the profession, and the College. In particular, it would not only avoid needless expense and overlapping, but would also tend to

efficiency if a large portion of the instruction on drawing and building construction were taken in the Municipal School of Art and the Municipal Technical School, and that these objects could be best attained by the appointment of a representative committee and of a single director who should also be professor of architecture at the College. Those resolutions were signed by the chairman of the College and by himself, and forwarded to the authorities of the Municipal Technical School and the Municipal School of Art. He regretted to say that after several interviews with the committee representing these institutions their efforts had so far proved unsuccessful. Mr. Darbyshire afterwards spoke of the collaboration of the architect, sculptor, and painter where works were carried out in which an artistic ideal had to be realised.

EARLY RENAISSANCE ARCHITECTURE IN ENGLAND.

[WITH ILLUSTRATIONS.]

MR. R. J. A. GOTCH, F.S.A., has done well in publishing the guinea edition of his history of the English Renaissance, which Mr. B. T. Batsford has just issued from the press. The volume, of course, is not a reduced copy of the famous folios with which the author's name was brought into prominence a few years ago at the hands of the same energetic publisher, under the title of "Architecture of the Renaissance in England"; but the book brings within the compass of a large octavo volume the illustrated story of the development of the Tudor Gothic decadence into the style for all time associated with the Elizabethan period and the days of James I. No less than 250 illustrations, in addition to nearly 90 plates, amply elucidate the letterpress, which deals with the growth of plan as well as elevational detail, and with the planning of houses garden development is associated. We need not, for our present purpose, contrast in detail this work with the well-known pair of books covering similar ground written by Mr. Reginald Hone; but it is impossible not to classify these

treatises together, and if, after all, they differ distinctly in several ways, the interest of the subject becomes thereby all the more enhanced. Mr. Gotch confines his scheme to the earlier part of the 16th century, whereas Mr. Blomfield treats more fully of the 17th and 18th centuries. A large selection of the views in the present publication are from photographs by Mr. Gotch himself and some are from the well-known camera of the late John L. Robinson, R.I.A., who was known as hon. photographer to the A.A. Excursion, and it is from this series that the blocks in more than one instance have been made. That of Hengrave Hall, Suffolk, shows portraits of the excursionist who chanced to be there at the time, the writer of this notice among the number. The Architectural Association Sketch-Book plates are also brought into the series of cuts now and again, to the advantage of the volume, which commences with an inquiry as to the introduction of the Italian influence, which was first seen in England when the tomb of Henry VII. was put up in Westminster Abbey. Henry's son's monument known as Prince Arthur's tomb at Winchester Cathedral (1502) is not marked by any Renaissance detail, but its Gothic is distinguishable enough of the style which was preparing itself so to speak, to succumb to the imported change then impending, and at a time when Europe everywhere exercised by the prevalent feeling from Italian sources, it cannot be wondered at the England should have fallen also under the spell. Indeed it is probably only due to our isolate position that we do not see earlier instances of his influence, seeing that the Renaissance in Italy had reached its prime before our style was thus changed. Brunelleschi had been dead seventy years, and the exquisite sculpture which enrich the facade of the Certosa at Pavia were a testament a century old when Torrigiano applied Italian detail to the tomb at Westminster. Italian travel and the study of foreign methods paved the way in architecture, as men repaired to Italy to learn of humanities, so that when Cardinal Wolsey, following the example of Francis I. of France, employed Italian artificers, he started a fashion, encouraged its development, though national



The Swan Inn, Lechlade, Gloucestershire.

enough the earliest examples of the change existing show that the new fashion mainly was confined to superficial ornament. At most the exotic style was by no means general, and for the greater part is only found in individual tombs and monuments. And even here English traditional methods were too strong for the Italian influences to obtain unfettered sway. Instances of this mixed mannerism are to be seen in Bakewell Church, near Haddon Hall, Sir Thos. Andrews' monument in Charvelton Church, Northamptonshire; and others in Ashbourne Church, Derbyshire. The eastern counties were sooner influenced by the new movement, as at East Barsham Hall, Lamer Marney Tower, the Sedilia in Wyndham Church, or the Tomb in Oxburgh Church often

plan and view of Oxburgh, and he supplies a ground plan of Great Chalfeld, Wilts., a Perpendicular house built in the days of Henry VI., but where there is, if we remember rightly, a good vaulted parlour and contemporary Renaissance chimney-piece. East Barsham is little more than a red-brick ruin, and hard by, near Walsingham, is the frequently quoted Rectory at Great Snoring. No more lovely house exists than the Gothic house of Compton Wynyates, Warwickshire, built in 1520, where there is not much Italian influence to be seen externally, and Hengrave Hall, built in white brick, in Suffolk, is mainly Tudor. The home of the Gages has, however, an oriel of quaint design over the main entrance marked by the coming fashion.

least, Wiltshire, and Wollaton Hall; Burghley House, near Stamford, are given among the larger mansions illustrated, and Kentwell Hall, Suffolk, and Corsham Court, Wilts., are shown by small views similar to that of the Swan Inn, at Lechlade, given herewith. Another subject which we have chosen is the Gothic-like bay from a cottage at Stevenston, Berks. Mr. Gotch includes a series of houses from Yorkshire, including Barton Agass, a work of somewhat earlier date than Bickling, which again was earlier than Lilford Hall, Northants, in a kindred style. Chapters are given of interiors and chimney-pieces, ceilings, cornices, and staircases. Other pages are illustrated by tombs, pulpits, font covers, and screens. The work concludes with drawings by John Thorpe, and the origin of the modern architect is discussed interestingly. We thus go over familiar ground, and learn more than we ever knew before of architectural archaeology, considered from an architect's point of view, and intended to lead in the direction of improved design and a further development of style on the old lines. There is, probably, no safer guide; but a signpost points the way without going, as they say is the usual characteristic of all preachers. The difficulty is to inspire the designer—the impossibility of creating him is acknowledged; but some say that inspiration comes not by dates and figures, and that the dry bones of analysis serve but to prevent vitality and force. Of making of many books there is no end. To buy a few and read them well, provided they be worthy of intimate study, is the safest rule for all ordinary learners who perform seem actuated by a desire to avoid the surfeit of too much learning, which is said to be a weariness of the flesh. If we were asked to make a choice just now for the library of a beginner we should not forget the books of our youth, including a Stuart and Revett "Athenian Monuments," or Rickman's "Attempt at Gothic," and we should certainly include this new volume published by Mr. Batford—viz., Gotch's "Early Renaissance Architecture in England."

HOW TO ESTIMATE: OR, THE ANALYSIS OF BUILDERS' PRICES.—XXVIII.

By JOHN T. REA, F.S.I., Surveyor, War Dept.

WOODEN PATTERN FOR STANCHION.

THE following analysis will show how to arrive at the price of a yellow pine pattern (usually allowed for in a bill of quantities) for casting an iron stanchion.

A pattern-maker's pay is 9d. per hour, but the actual rate varies from 5s. upwards per day. Such work as making a stanchion pattern would occupy, on the average, about half an hour per foot super, of the stuff used, with 1-12th hour additional per foot run for all rounded or shaped edges and filleted angles.

The box on the top of the stanchion cannot be moulded hollow, and therefore it would be closed in and a "print" put on the end to make an impression in the sand to support the end of a "core," the weight of the other part being borne by a "chaplet." A very simple "core-box" like a brick mould would suffice in this, in which the sand could be rammed and the edges of the core trimmed off after it was dry. The pattern itself is accurately formed in pine a little larger than the required casting, so as to allow for contraction in cooling.

3.3	feet super, lin. yellow pine at 3jd.	a. d.	0 11
20.2	" 1in. " 4jd.	"	7 11
56.10	feet runarris fillets at jd.	"	2 41
3.3	" 20.2	"	
23.5	feet super, at jd. for nails and screws.	"	0 6
23.5	feet super, at 11d. for nails and screws.	"	8 71
96.3	feet runarris fillets at 8d. for nails and screws.	"	6 0
	shaped edges	"	2 7
	10d. per cent. profit	"	23 2
	Total cost of pattern	"	23 2

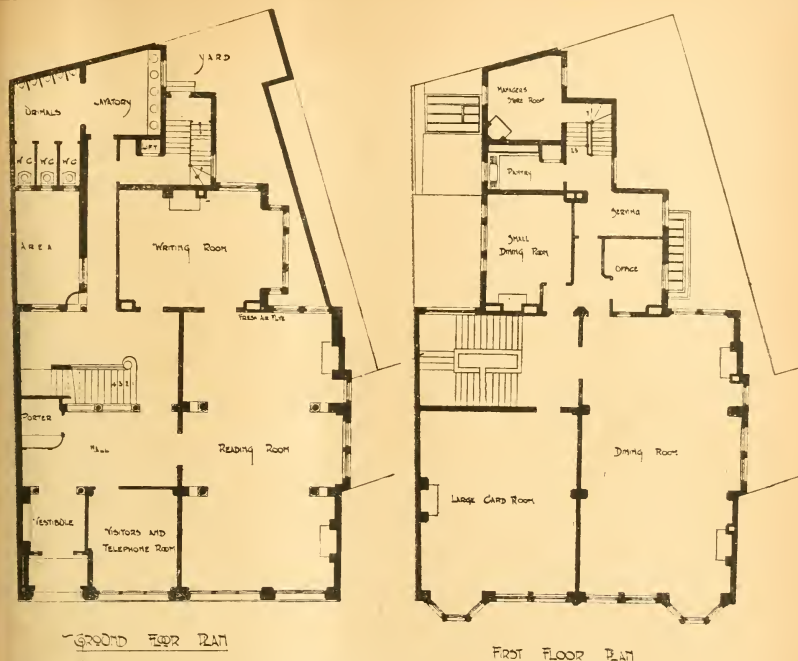
Pitch Pine.—The best of this timber comes from the United States, from the ports of Georgia, Pensacola, Darien, Savannah, &c. It is heavy, strong, free from knots, well marked, and full of resin, but is liable to shakes. From its beauty of figure it is much in demand for joinery



Montacute House.

mentioned. The Salisbury Chantry, Christchurch, though probably not the work of an Italian, displays a feeling for Renaissance detail in a marked degree. The Spring pew screen at Lavenham, the baldachin over the font at Trunch Church, Norfolk, and the screen in the chapel at King's College, Cambridge, show a further development, while at Hampton Court Palace the roof of the great hall is distinguished by decidedly Renaissance forms. No one will dispute this statement, of course, but Mr. Gotch traces how it came about. When Laycock Abbey was secularised and turned into a gentleman's house after the dissolution of monasteries, the famous place of Nonesuch was being built; William Sharrington, to be in the fashion, modified the place with Renaissance detail in the chimney-pieces, panelling, smoke flues, and by the erection of the range of stables, of which latter we give a view. Mr. Gotch gives a

Kirby Hall is too well known to need more than a passing reference, and so is Montacute, of which we print a photograph of the garden front. Doddington Hall, Lincolnshire, with three cupolas, has something in common with the type of plan illustrated by the before-mentioned Somersetshire example, while its walls recall Hatfield, though plain in detail. Aston Hall has the hall still central; but the family apartments are in one wing and the kitchen department is located in the other, the hall becoming a mere entrance, and has ceased (1618-33) to be a living-room. Under the heading of exterior features, the author instances examples of gate-houses, porches, entrances, and minor doorways, from such houses as Cranborne Manor, Hambleton Hall, Gorbamby, Herts; Woolas Hall, Worcester; Westwood, in the same county; and Stanway, Gloucestershire; Long-



THE BOROUGH CLUB, NOTTINGHAM.

District Council, Mr. Burgess, chairman of the Liverpool Water Committee, Mr. Castle, of Garfield, Yorkshire, Mr. J. Siddalls, of Tiverton, Mr. J. Freer, clerk to the Leicestershire County Council, Mr. T. Reader Smith, of Kettering, and Mr. Frederick Verney, L.C.C. took part, the last speaker referring to the difficulties with which the London County Council had to contend in regard to the water supply. A statistical paper was read by Dr. H. K. Mill on "Rainfall and Population of England and Wales in Relation to Water Supplies." Dr. Mill came to the conclusion that we have rain enough to satisfy all the demands that are ever likely to be made on it; but the cost in many localities will undoubtedly be great, and might become prohibitive. Hence the necessity for economy. It was not the water we used, but the water we wasted, which gave cause for anxiety. For years to come the prevention of waste would be the most important of all economies, and to prevention of the waste by the regulation and inspection of fittings, and the education of consumers, he looked for the chief protection against water famines.

A resolution was adopted affirming that the purity of water supplies throughout the country could only be effectively secured by placing such supplies in the hands of representative bodies directly responsible to the consumers.

In the afternoon the delegates visited the New River Company's testing shops and the East London Water Works at Lea Bridge.

THE BOROUGH CLUB, NOTTINGHAM.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

THE drawing from which this illustration was taken appeared at the Royal Academy exhibition this year. The plans show the internal arrangement of the two principal floors, which are devoted to spacious reception and other apart-

ments to be used by the members. The elevation is in red brick and stone, the front being marked by large windows and two turrets rising above oriel bays and flanking the central gable. Mr. Gilbert S. Doughty is the architect.

APPRENTICESHIP AND TECHNICAL EDUCATION.

THE Committee of Representatives of District Councils for the following places: Belfast, Birmingham, Bradford, Cardiff, Dublin, Edinburgh, Glasgow, Leeds, Liverpool, Manchester, Nottingham, Plymouth, and Sheffield, acting in conjunction with the Plumbers' Company, deem it highly desirable a prescribed apprenticeship or course of training should be recognised in connection with the National Registration of Plumbers.

A special form of indenture has been prepared for the purpose by a conjoint board composed of representatives of the London Society of Associated Master Plumbers, the United Operative Plumbers' Association of Great Britain and Ireland, and the Plumbers' Company.

The indenture is based on the form of indenture authorised by the Corporation of the City of London, and approved by the Court of Chancery. It includes definitions of the character and scope of the work of the registered plumber and of the term "sanitary plumbing," as approved by the Parliamentary Committee on Trade, in order that the sanitary bearing of the work of the registered plumber may be generally recognised by plumbers as well as by architects, health authorities, and others, as constituting the reason for the registration system and the ground of the application for statutory powers to be conferred on the registered body.

These definitions are in the following terms:—"The trade of a plumber and the art of sanitary

plumbing, including all branches of the said trade or of the said art which require technical knowledge of water fittings and other sanitary appliances and skill to construct and adjust the same in such manner as to prevent the contamination of air or water in dwelling-houses or other buildings by emanations from drains or sewers." Covenants are included expressly providing for:—

- (1) The attendance of the apprentice at approved Classes of Technical Instruction.
- (2) The apprentice presenting himself for annual examinations in technical knowledge and workmanship in conformity with such rules and regulations as may from time to time be prescribed in connection with the National Registration of Plumbers.
- (3) The cancelling of the indenture after due notice to the parties, in the event of the apprentice failing to pass a satisfactory examination in the third year of his apprenticeship, provided such cancellation be recommended by the examining body.

It is recommended that this form of indenture (subject to such modification as may be necessary to meet special cases) should be generally adopted with a view to a uniform qualification being established for the purpose of the National Registration of Plumbers. It is also recommended that a register of apprentices should be kept in each district. It is hoped that the desire to provide an efficient system of training for the coming generation of plumbers will have the sympathy and support of all corporations and urban district councils, and that they will encourage the object by securing the adoption of the prescribed form of apprenticeship as far as possible in their districts.

NOTE.—A corresponding form of indenture is prepared adapted to the requirements of Scotch law.

New Sunday-school premises, erected in connection with Wesley Chapel, Spittlegate, Grantham, were opened on Friday. The school will accommodate 400 children, and the cost has been £2,430.

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ILLUSTRATIONS.

THE BOROUGH CLUB, NOTTINGHAM.—RESIDENCE, MANOR PARK, RUDDINGTON.—HALL INTERIOR AT ROHAM.—NEW BANK OF LIVERPOOL, CHESTER.—ADDRESS GRANGE, HANTS.—NEW HOTEL, BUXTON.—HOUSE AT ASHFORD.—DAVID LEWIS MEMORIAL CLUB AND HOME, LIVERPOOL.

Our Illustrations.

THE BOROUGH CLUB, NOTTINGHAM.

(For description and sketch plans see p. 517.)

NEW RESIDENCE, MANOR PARK, RUDDINGTON. HALL



GROUND FLOOR PLAN

NEW RESIDENCE, MANOR PARK, RUDDINGTON.

This building, from the designs of Mr. Gilbert S. Doughty, of Nottingham, is here illustrated by the architect's Royal Academy drawing.

HALL AT ROHAM.

This interior was recently executed for Mr. E. W. Beckett, M.P., by Messrs. Hindley and Wilkinson, of Old Bond-street, W., from the designs and under the superintendence of Mr.

ADDRESS GRANGE, HANTS.

This house has been erected by practically pulling down the old house which formerly occupied part of the site, and by rebuilding it according to the accompanying plans. It is most picturesquely situated on a plateau between two steep escarpments, and is surrounded by excellent scenery. The ground floor consists of a large staircase, hall and inner hall, drawing-room, dining-room, library, and offices. A billiard-room, crowned

by a copper-covered dome, forms the eastern wing, and serves as a screen to the kitchen approach. The exterior is in a quiet mullioned type of design. The whole of the ground floor has been panelled in oak to a height of about 9 ft., and also in oak are the mantelpieces of the principal rooms. Modelled plaster has been used for the ceilings, and oak parquet borders for the hall and borders of the principal rooms. The general contractors for the whole of the work were Messrs. Gough and Co., of Hendon. The works have cost about £17,000. The whole of the buildings have been carried out according to the designs and detail drawings, and under the superintendence of the architects, Messrs. Banister Fletcher and Sons.

ST. WERBURGH-STREET, CHESTER.

This street, which formerly was a very narrow one, leads from Eastgate-street, the principal street in the city to the Cathedral. On account of its width, the buildings on one side have been removed, and in their place a new branch bank of the Bank of Liverpool, Ltd., and eight shops, together with a separate block of buildings at the end nearest the Cathedral, consisting of a shop and offices have been built. The Bank of Liverpool was first intended to be erected after a quaint design in stone; but owing to the late Duke of Westminster's intervening and using his influence with Mr. Lyle Smyth, a director of the Bank, and then High Sheriff of Cheshire, the Directors met the Duke's wishes by carrying out the upper portion in half-timbered work. It was intended to carry a broad walk from the upper end to the City walls, on the line of which there is the best view of the Cathedral. The late Duke was in favour of this, but now that he has gone it is not probable that this desirable improvement will be carried out. It is chiefly owing to the efforts of the Town Clerk that a successful understanding as to the buildings was arrived at, and as regards the elevations, they were agreed to be left to Mr. John Douglas, architect, of Abbey-square, thus rendering it possible for the buildings to be what they are. The buildings have been carried out at a cost of a little over £15,000, to the complete satisfaction of the Chester Corporation.

NEW HOTEL, BUXTON.

This large establishment, of which we shall shortly give plans and elevations, has been erected at Buxton, from the designs of Mr. Thomas Garner (Messrs. Bodley and Garner) but the decorations are not in accordance with his scheme, so far as the upholstery is concerned. The work has been done for Messrs. Spiers and Pond; but we have no description of it. The ironwork was executed by Messrs. Keeling, Teale, and Co., of Hammersmith. The view now given is from a photograph sent us by the architect.

HOUSE AT ASHFORD, KENT.

This picturesque country residence is illustrated by two views and plans. The upper part is in half-timber, treated vertically, with gables and bays below to the chief rooms. A tower rises above the principal staircase. Messrs. Banister Fletcher and Sons are the architects.

THE DAVID LEWIS WORKMEN'S HOME AND CLUB, LIVERPOOL.

As promised last week, when we gave an

NEW RESIDENCE, MANOR PARK, RUDDINGTON. HALL

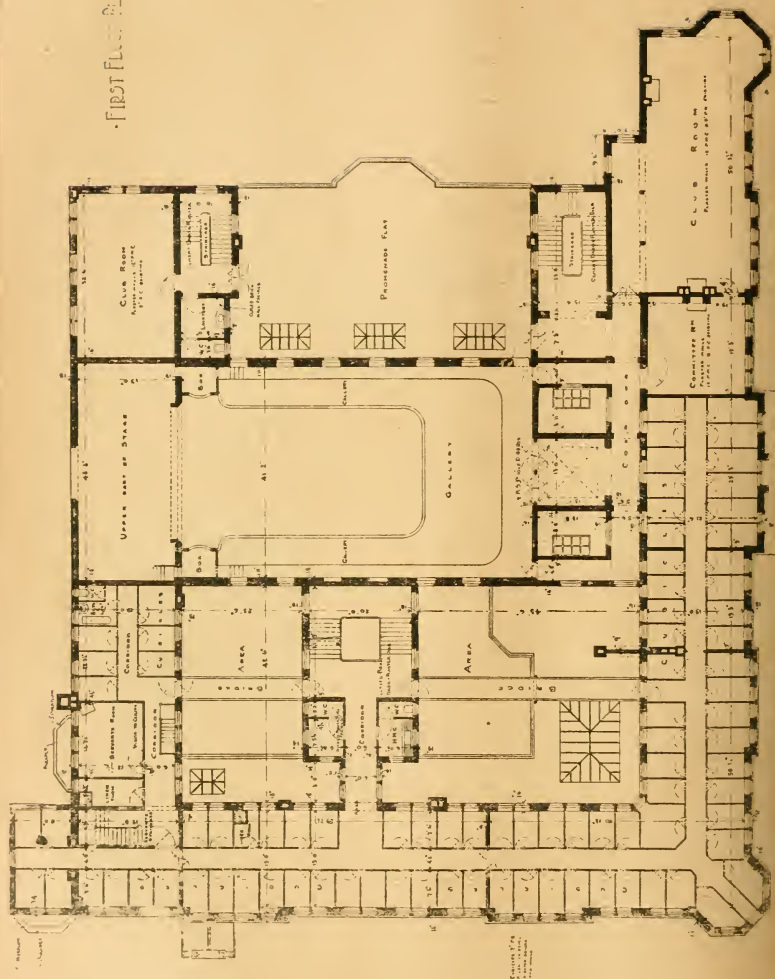


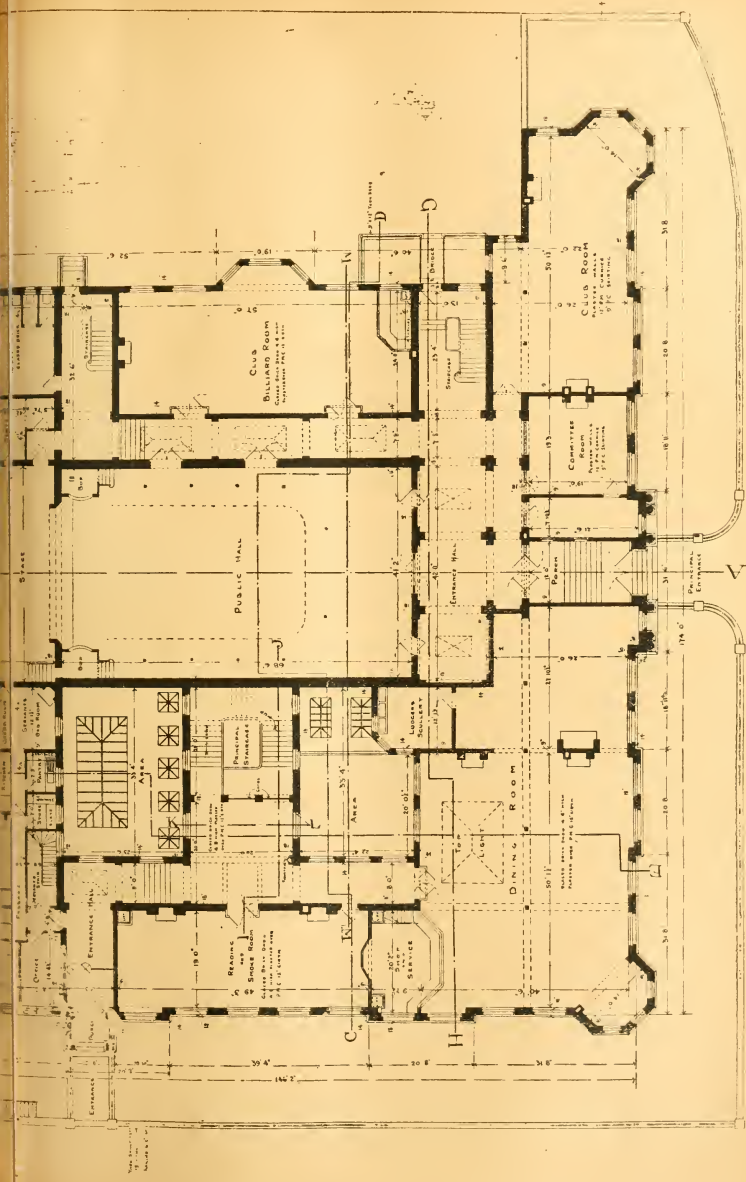
FIRST FLOOR PLAN

exterior perspective of this building, we now reproduce the plans. The architect is Mr. J. Francis Doyle, and the building was fully described on p. 485.

The new schools, Feltham, Middlesex, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

First Floor Only.





PLANS OF THE DAVID LEWIS WORKMEN'S HOME AND CLUB, LIVERPOOL.

Engineering Notes.

SEACOMBE.—The slow and otherwise unsatisfactory method of handling the vehicular ferry traffic at the Seacombe Stage has been the subject of a special report by Messrs. Wood and Fowler, M.I.C.E., to the Walworth Ferry Committee. The engineers explain in detail various schemes of improvement, and recommend the provision of new lifts, with foundations and approach gangways, estimated to cost £14,597, and fresh boilers, engines, and house, estimated at a further £2,400. The engineers advise the construction of a floating road-bridge, affording uninterrupted means of communication between stage and shore. They estimate the cost of such a bridge, with two carways, an alley-way, and two footpaths, at the south end of the stage—£30ft. in length—to be £47,500, exclusive of the cost of land, and the period of construction about twenty-one months. The Ferris Committee recommended the urban council to instruct Messrs. Wood and Fowler to prepare plans and estimates for the provision of engine-house, with boiler and engine (£2,400), altering old lifts (£3,000), and filling up the stage embayment (£4,700), and to allow £900 for contingencies, making a total of £11,000.

CHIPS.

By an unfortunate compositors' blunder in our obituary notice of Mr. James Brooks, last week, p. 483, we were made to say that Mr. Brooks was "three" married instead of "twice," as penned.

A special meeting of the Brierley Hill Urban District Council was held on Monday night, when Mr. Lailey, Haysham, was appointed surveyor out of 32 applications.

Mr. E. Cruttwell, M.Inst.C.E., who, in conjunction with Mr. A. Murray, the city surveyor, has been intrusted by the Bridge House Estates Committee with the carrying out of the widening of London Bridge, has recently entered into partnership with the firm of Sir John Wolfe Barry and Partners, of 21, Delahay-street, Westminster.

The new Sacred Heart chapel and sacristies which have been added to the Roman Catholic Church of SS. Peter and Paul, North-street, Wolverhampton, as a memorial to the late Lord de Ros, the patron of the church for forty-seven years, was dedicated yesterday (Thursday). The cost of the work has been £17,000.

The first completed portion of the new church of St. Matthew, at Villenden, was consecrated by the Bishop of London, on Saturday. The church will be built from plans by Mr. W. D. Caroe, F.S.A., architect to the Ecclesiastical Commissioners. The first portion of the permanent church now built consists of the chancel, morning chapel, transepts, and two bays of the nave, providing accommodation for 500 people. The total cost will be about £7,000.

Keighley Association of Engineers inaugurated their winter session on Saturday evening with a lecture on "The Strength of Materials and the Use of Testing Machines," by Mr. G. F. Charnock, M.I.C.E., Bradford Technical College, Mr. H. C. Longdon (the mayor) president. Mr. Charnock entered into an analysis of some well-known pictorial statements as to the strength of bicycle frames, rims, spokes, and chains, and showed that the calculations were humorous exaggerations, based on very imperfect knowledge with regard to the testing of steel.

A new hall, which has been built as part of a memorial to the Rev. C. H. Prior, late tutor of Pembroke College, Cambridge, in connection with the College Mission in Walworth, was opened on Wednesday week. It has been built from plans by Mr. E. S. Prior, at a cost of £1,600.

Mr. John Morley will unveil the statue of Mr. Gladstone in Albert-square, Manchester, on the afternoon of Wednesday next.

The foundation-stone of the new wing of the Royal Hospital for Incurables, at West Hill, Putney, was laid on Wednesday last by Mrs. T. M. Restell, widow of the donor, with whose bequest of £6,000 the extension is being erected.

Mr. Andrew Carnegie has offered Clackmannan £1,200, and Rutherglen, Glasgow, £7,500 for the purpose of erecting free libraries.

Mr. J. S. Brodie, the Blackpool borough surveyor, after visiting the principal watering-places of England and the Continent, presents his report, and suggestions as to the best form of sea wall for Blackpool, and the extent of the promenade widening. He recommends a wall of nearly upright or curved face, and is in favour of 70ft. widening. This will permit of a promenade 70ft. wide, a carriage-way 40ft., tramway 17ft., and two footways.

PROFESSIONAL AND TRADE SOCIETIES.

ENGINEERS AT NUNEATON.—On Saturday the members of the Midland District of the Incorporated Association of Municipal and County Engineers held a meeting at Nuneaton, 150 members being present. They were officially received by Mr. T. Horton, C.C. (vice-chairman of the Nuneaton and Chilvers Cotton Urban District Council), with whom were most of the members of that body, and then the usual meeting was held, with Mr. F. C. George (chairman, M.I.C.E. of Leicester) president, in the chair. A paper on "Municipal Work in Nuneaton" was read by Mr. J. S. Pickering (hon. district secretary and surveyor and engineer to the Nuneaton Council), a discussion following, amongst those who took part therein being the chairman, Dr. Bostock Hill (Birmingham), Messrs. R. C. W. Herrington (president of the Birmingham Association of Students of Civil Engineering), Price (Birmingham), Dawson (Banbury), Lockley (Hanley), Eyres (Birmingham), Smith (Kettering), Watson (Birmingham), Lowry (Newcastle), Griffiths, Lowcock, &c. Afterwards the party visited the brick and tile works of Messrs. Stanley Brothers at Stockingford, where they were entertained to luncheon. They also visited the council's sewage and electricity works.

GLASGOW ARCHITECTURAL ASSOCIATION.—This association held its first meeting for Session 1901-2 in their rooms, 187, Pitt-street, on Tuesday night, October 1, when Mr. Charles E. Whitelaw delivered his opening address. There was a good attendance of members. The office bearers for the session are Messrs. Chas. E. Whitelaw, president; Wm. J. Blair and James Lochhead, vice-presidents; Alexander M. Malcolm and Wm. J. Lukeman, hon. secretaries; James Haldar, hon. treasurer; D. Bennett Dobson, hon. librarian. After making a few remarks on the work of the association during the past session, Mr. Whitelaw said that instead of, as customary, giving a paper of a general nature, he had chosen a subject which he thought would lead to the opening of a new era,—"The Disintegration of the National Ecclesiastical Monuments of Scotland." The lecturer divided his subject into three sections:—1. The English Raids. 2. The Religious Revolution. 3. The Period of Decay. Commencing with the period of the Reformation, he referred to Henry VIII. of England, a Protestant, trying his utmost to bring his nephew, James V. of Scotland, over from the Church of Rome, the lecturer went on telling of Henry's failure, and to counterbalance the failure of his intrigues, his standing army of 10,000 men was employed in 1542-47, during which disastrous period all the border monasteries, with Holyrood Abbey and a greater number of lesser ecclesiastical buildings, shared in the general destruction. He then referred to the Reformation in Scotland, 1545, in which many monasteries were pillaged, particularly mentioning Dundee, Perth, and Aberdeen. Reliable information, he said, about this period is very scanty; but from it we would infer that the buildings themselves were not destroyed, but with the cathedrals merely purged of the altars and offending images. The famous singing-dome of St. Giles' was the only one which escaped the imagination of a posthumous writer, the real cause of ruin being neglect and faulty construction. Mr. Whitelaw then spoke of the establishment of Protestantism in 1561. The cathedrals and abbeys already used as parish churches were to be maintained, but the only one which remained, for the unprincipled men lately at the head of so many of the ecclesiastical establishments had already disposed of a large proportion of the church property to their own advantage. Scotland, he said, was very poor, never having recovered from the effects of long-continued wars with England, hence we find the great churches, unable to maintain themselves falling into partial ruin. The period of destruction and decay, the lecturer stated, dates from 1561, when the various towns and cities were pulled down by enterprising town officials to build tobacco- &c., by country lairds to build mansions, and by farmers to build steadings and dykes—a practice only put a stop to during the Gothic Revival in the first half of the 19th century.

GLASGOW TECHNICAL COLLEGE AND ARCHITECTURAL CHAFTSMEN'S SOCIETY.—The opening address of the sixth session was delivered by the president, Mr. Jas. M. Kiskuck, on Friday, the

11th inst. The subject of his remarks,—"The Conditions and Problems of Modern Architecture," was treated in a manner well calculated to be of value to both craftsman and architect. The new syllabus placed in the hands of the students should prove conducive to a most profitable session.

LANDSD ESTATE AGENTS' SOCIETY.—The inaugural meeting of the Lands Estate Agents' Society was held on Friday last at the Golden Cross Hotel, Charing Cross, and was well attended by members from all parts of the kingdom. Colonel Haldar, Weymouth, was elected president, and reported the work done by the provisional council, which was considered most satisfactory. A new council, consisting of the gentlemen who had previously acted on the provisional council and nineteen others, making twenty-five in all, was elected for the year, and arrangements made whereby local branches as formed could appoint representatives to the council. Mr. William Broomfield was elected secretary. The members who have already joined the society represent approximately 5,000,000 acres of agricultural land.

NORTHERN AGRICULTURAL ASSOCIATION.—This association on Saturday had an excursion meeting, and a special lecture in Newcastle-on-Tyne. The interest was visited by between forty and fifty members. The first building visited was the suite of offices, &c., of the Newcastle Breweries Co., Ltd., a new building that has been erected in the Haymarket, Newcastle. The whole place is a masterpiece of modern architecture, and a system of ventilating works with either warm or cold air. Later the association inspected the electric power-station of the Newcastle Corporation along the City-road. The lofty, rectangular brick structure, with its massive wheels and machinery, proved less attractive than the Haymarket itself; but it was by no means devoid of interest.

THE INSTITUTION OF CIVIL ENGINEERS.—The council of the Institution of Civil Engineers have, in addition to the medals and prizes given for communications discussed at the meetings of the Institution in the last session, made the following awards in respect of the papers delivered:—A Telford Premium to Telford, a Telford Premium to Reginald Pelham Bolton (New York); a Watt Medal and a Telford Premium to J. Emerson Dowson (London); a George Stephenson Medal and a Telford Premium to W. T. C. Beckett (Glasgow); a Manly Premium to E. K. Scott (London); a Telford Premium to T. A. Hearson, R.N. (London); a Telford Premium to J. A. W. Peacock (Tantah, Lower Egypt). For Students' Papers the awards are:—A Miller Scholarship (tenable for three years) and the "James Forrest" Medal to E. V. Clark, B.Sc. (London); Miller Prizes to C. E. Tregidg, B.A. (London); H. E. Wimperis, B.A. (Cambridge); J. L. Cridlan (London); F. K. Pench (London); G. H. Whigham (Glasgow); F. Taylor, B.A. (Manchester); A. C. Walsh (Newcastle-on-Tyne), and H. O. Jones (Manchester).

The sales at the Mart last week, as registered at the Estate Exchange, amount to £53,805, the figures for the corresponding week of last year being £30,135, a comparatively small increase, and a transaction of the week, though signs are not wanting of considerable improvement in the near future.

A Local Government Board inquiry was held on Friday by Ch. Heppen, D.S.O., R.E., at the Assize, in connection with the proposed sewerage scheme, an application having been made by the Long Ashton Rural District Council for power to borrow £4,000 for the purpose. The scheme was supported by the engineers, Mr. F. I. Cottrell, of Bristol.

The Mayor of Warrington formally opened, on Friday, the new constabulary buildings which have been erected by the Warrington Corporation in Appleby-street. The premises, which will accommodate 220 men, are still in the builder's hands, and the police-court is the only portion which will be used for the present. They have been erected from designs by Mr. L. Burns Dick, of Newcastle-on-Tyne, signed in conjunction by Mr. J. Bennett, of Manchester, and illustrated in the BUILDING NEWS for April 14, 1899.

Mr. R. W. L. Phillips, chief assistant engineer to the Bristol Corporation, has resigned his appointment on being appointed borough electrical engineer to Bristol. The council of the Corporation of the Bristol City Council have decided to recommend the council to appoint Mr. H. H. Couzens, mains engineer, to the position vacated by Mr. Phillips, and to advertise for a successor to Mr. Couzens.

ment reaching to the knee and having hanging sleeves from the elbow. At a broad belt hangs his *gipeiro* or purse. On either side of the figure is the lower part of a column with a base. The costume of this figure and the form of his *gipeiro* at once fix the date of this tile as falling between 1330 and 1375, in the reign of Edward III., and although the figure is rude enough in execution (it had probably to be sketched rather rapidly on the soft clay before passing into the kiln) it has the unmistakable character and style of its period. The drawing of the figure, such as it is, is free and bold, and the lines are sharply incised.

This resolution on the operations of the Survey Department of India during the year 1890-1900 states that the total output of detail survey during the year amounted to 149,677 square miles, which included 110,259 square miles of reconnaissance surveys on thin, smaller scales on the north-east and north-west frontiers. The total area of rigorous surveys on all scales was 29,418 square miles. The total area triangulated was 41,110 square miles, including 16,000 square miles triangulated in connection with reconnaissance surveys. The total area traversed for cadastral purposes was 5,850 square miles.

A house built on an octagonal plan is described by a Philadelphia newspaper, whose correspondent touches for some special advantages in a building of this shape. It is, it is claimed, more compact and more readily heated than the long, square houses now generally built. Through the middle of the house, from the ground floor to the roof, is a stairway, and the rooms are built around this. There are four chambers, which are square, or very nearly so, and sandwiched among these are four smaller and irregularly-shaped rooms, which are available for playrooms, servants' room, sewing-rooms, and similar purposes. The heater in the cellar is located directly in the middle of the house, and the pipes radiating from it in no case extend more than four or five feet, where they take an upward turn and are carried to the upper floors through an octagonal wall, following the general lines of the outer wall. These pipes go directly by the shortest line to the rooms which they are intended to heat, and therefore very little of the heat is lost in the process of delivery. The occupant of the house says that his one complaint is that half that of his neighbour, who occupies a stone house rectangle. In the summer time it has a like advantage. No matter from which direction the wind blows, a fine current of air can always be found there. By throwing open the windows of a cupola on the top of the house and opening the doors and windows at the sides, from which the wind is blowing a strong draught is immediately experienced, the walls acting like a chimney.

The ancient forest church of Hampthwaite is undergoing restoration at a cost of about £2,500.

The largest sewer in the United States is soon to be built in Brooklyn. It will be built of brick, and will be oval in form, with a maximum diameter of 15ft. for a mile of its length.

Mr. Charles D. Hodder, who has been the headmaster of the Edinburgh School of Art, Royal Institution, for the last forty years, has now resigned that appointment.

By notification in the *Gazette*, authority to accept and wear the insignia of honours conferred upon him has been granted to Mr. Augustus Zarb, the Fifth Class of the *Medjidieh*, conferred by the Khedive for services as assistant to the architect of the Khedivial Palaces.

St. Mary's Church, Fishponds, Bristol, built 80 years since and enlarged in 1871, is about to be enlarged from plans by Mr. E. H. Lingon Baker, of Exford, at an estimated cost of £1,700.

Colonel A. J. Hepper, D.S.O., R.E., on behalf of the Local Government Board, sat in the Council Chamber, Bridgwater, on Friday to hear an application by the Bridgwater Rural District Council for sanction to borrow sums amounting to £24,000 for the purpose of obtaining water supply for the parishes of Chedzey, Chedzey, North Polderton, Pawlett, and Puriton (including the construction of works in the parishes of Bridgwater Without, Broadfield, Chilton Trinity, and Gonthurst).

Messrs. Dick, Kerr, and Co., of London, and the English Electric Manufacturing Co., of London, have been intrusted with the construction of the new electrical system of tramways for Calcutta—a system by which Mr. Maples, the manager of the Calcutta tramways, hopes to revolutionise tramway travelling in Calcutta, so as to make it popular with rich and poor alike.

Trade News.

WAGES MOVEMENTS.

THE LABOUR MARKET IN SEPTEMBER.—The monthly memorandum prepared by the Labour Department is based on 2,415 returns—1,706 from employers, 585 from trade unions, and 124 from other sources, and reports that the state of employment in September shows a slight improvement as compared with August in most of the important industries, but it is not quite so good as a year ago. There were 142 trade unions, with an aggregate membership of 542,917, making returns, 20,180 (or 3.7 per cent.) were reported as unemployed at the end of September, compared with 3.9 per cent. in August, and with 3.6 per cent. in the 138 unions, with a membership of 536,242, from which returns were received for September, 1900. Employment in the building trades is scarcely so good as it has been. The percentage of unemployed union members among carpenters and plumbers at the end of September was 2.9 compared with 2.7 per cent. in August. The percentage for September, 1900, was 2.1. In the furnishing trades most branches show a slight improvement. The percentage of unemployed union members at the end of September was 3.2, compared with 3.5 per cent. in August, and 4.0 per cent. in September, 1900. Thirty-three fresh disputes began in September, 1901, involving 8,654 workmen, of whom 5,808 were actually employed, indirectly affected; but of these disputes only three occurred in the building trades. The changes in wages reported during September affected 12,890 workpeople, and the net effect of all the changes was an advance averaging 9½d. weekly per head.

BUILDING TRADE EMPLOYERS' ASSOCIATION.—An important gathering took place at the Builders' Exchange, Leeds, on Tuesday, of representatives of the various National Associations connected with the building trades. For some time past a committee has been at work for bringing into closer union the building trade employers. Meetings have been held in connection with the various trades affected, at which draft rules have been agreed upon. The meeting, which was met in Leeds, was primarily engaged in making the necessary arrangements for propaganda work, &c. The name by which this association is to be known is that of the Federation of National Associations of Master Builders, Plumbers, and Slaters, and, as the name indicates, will include these three National Associations, while the rules also provide for the inclusion of other National Associations connected with the building trade. The principal object of the Federation is to promote the adoption of a common policy on all matters affecting the associated trades. The election of officers resulted in the appointment of Mr. W. R. Thompson, of Dewsbury, as president; A. Wheaton, Leeds, vice-president; Mr. Dyson, Halifax, treasurer; and Mr. Geo. Soall, Birmingham, secretary.

THE FURNISHING TRADE IN LANCASHIRE.—The Alliance Cabinetmakers and Furnishing Trades Association, which is to be amalgamated with the Society of Furnishing Trades Association, under the title of the "National Furnishing Trades Association," in its monthly report, issued on Tuesday, says that trade remains in a very unsatisfactory state. In Manchester itself trade is reported to be moderate except at one shop, but in Liverpool it is bad, as it is also in Blackburn, Preston (where it is reported worse than it has been for several years), and Accrington. In Stockport and Barrow-in-Furness trade is reported to be quiet. The only places where business is reported to be at St. Helens (very fair) and Lancaster.

At a special meeting on Tuesday the parish council of Glasgow accepted tenders for hospital extensions at Barnhill. The total cost involved was £25,707. The tenders accepted were, with one exception, the lowest received.

The Royal treasury on Tuesday propose to erect an obelisk at Balmoral to the memory of Queen Victoria, and the King has approved of the scheme. It will occupy a prominent position in the Monument Park between her Majesty's tomb and the memorial of the Prince Consort. The obelisk, which is to be 30ft. in height, will be made of stone from the Glengelder quarry. A flight of steps will lead to a platform where the inscription will be placed. The monument has been designed by Mr. Anderson, the clerk of the works at Balmoral.

The Town Council of South Molton have decided to adopt the report of the Gas Committee, which recommended an expenditure of £1,026 on purifiers, and on laying gas-pipes. Mr. W. J. Willey, of Exeter, has been instructed to prepare plans accordingly.

New furnishing premises and showrooms are being added to business premises in Commercial-street, Newport, Mon., for Mr. P. E. Gurn, of Bristol. The architect is Mr. H. Dare Bryan, of Bristol.

MEETINGS FOR THE ENSUING WEEK.

FRIDAY.—Architectural Association. Conversation at Royal Institute of Painters in Water Colours, Piccadilly, 8 p.m.

CHIEFS.

The Bishop of Lichfield preached at Christ Church, West Bromwich, on Sunday, at a special service in connection with the rehanging of the bells. The cost of the scheme of church improvement, including the rehanging of the bells, just completed, is about £500.

Major Pringle, Board of Trade inspector, inspected at Southampton yesterday (Thursday) a section of the new tramways from Terminus-terrace to the Floating-bridge.

The repairs and additions to the protection works of the "Kaiser-i-Hind" Bridge over the Sutlej river, near Ferozepore, and repairs to the North-Western of India Railway line, caused by the failure of the same last year during the floods, have cost the railway about £50,000 sterling. The stone balustrade required for the bridge from the Wadiar Quarry, near Wazirabad, about 115 miles from Ferozepore.

Lieutenant-Colonel Von Donop, on behalf of the Board of Trade, has inspected and passed the reconstructed tramway line between the Sedgely depot and the Fighting Cocks, which has recently been completed for a continuation of electric traction from Dudley. Passengers are now able to travel through to the boundary of the Wolverhampton borough, the remainder of the journey to the centre of the town being traversed by omnibus. The extension of the line from Dudley, just inspected, is about three miles in length, and the work of reconstruction, including overhead equipments, has been carried out by Mr. G. Law, Kidderminster, contractor, in about three months.

At a meeting at Golspie of the directors of the North of Sunderland Light Railway Co., it was agreed to abandon the scheme. The line was intended to connect Forsinard, on the Sunderland-Cathness branch, with Port-Kerny, a length of 15 miles. Towards the estimated cost of £40,000 the Duke of Sutherland offered £10,000, besides all the land, and much of the material, but the balance has not been taken up.

At Cambridge the Mayor and Corporation have formally opened a new ice-station, which has been erected at a cost of £16,000.

A light railway, connecting the rich Gifford agricultural district of Lothians with the Ormiston branch of the North British Railway to Edinburgh, was opened on Monday. The new line, which is about nine and a half miles in length, has cost £100,000. Such a line have been built by Messrs. Gifford, Saltoun, and Pencaitland. Messrs. Joseph Phillips and Sons, of Westminster, were the contractors.

At the last meeting of the Town Council of Margate, the revised estimate for the Wingham water scheme at a reduced cost of £87,700, instead of £100,000, the sum formerly named, was agreed to, pending the consent of the ratepayers to go to Parliament for power to carry out the work.

Messrs. Geo. Jennings, Ltd., of Lambeth Palace-road, London, S.E., have been appointed Sanitary Engineers to H.M. the King.

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ESTIMATES GIVEN ON APPLICATION.

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LIST OF COMPETITIONS OPEN.

Admiral - Sewage Works Scheme	£20	J. A. Bromet, R.D.C. Clerk, Tadcaster	Oct. 31
Camberwell - E.R. - Baths and Washhouses, Old Kent-road			
Saxon School, F.R.I.B.A. Award	15sps., 73gs., 50gs.	The Town Clerk, Town Hall, Camberwell, S.E.	Nov. 31
Aldingham - Conservative and Gaiety Club	£20	W. Thompson, Aldingham	Nov. 31
Stockport - Municipal Buildings		Robert Hyde, Town Clerk, Town Clerk's Office, Stockport	Nov. 31
London, N.W. - Heurts of Oak Society's New Offices, &c.			
Euston-road Limit £15,000	£100 (merged), £73, £50	Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, Adelphi, W.C.	Dec. 31
Bexhill - Isolation Hospital	£25	E. Sholto Douglas, Clerk, Town Hall, Bexhill	Dec. 31
£300 - Laying out 12½ Acres of Land as Ornamental Grounds	£25	E. Sholto Douglas, Clerk, Town Hall, Bexhill	Dec. 31
Burslem - Isolation Hospital	£100, £50	Arthur Ellis, Town Clerk, Burslem, Staffs.	Dec. 31
Design of Cathedral - Gothic style imperative - Drawings of Designs of Executed Work			
Hull, A.C. School Limit £10,000 (Assessor, Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, W.C.)	£100 (merged), £50, £10	The Hon. Secretaries, Church House, South John-street, Liverpool, Jan.	Jan. 31
Cardiff - Chapel, Cathedral-road cost £5,000			
Middlebrough - Mission Hall, Clerk, and Chancery		E. Laverack, Town Clerk, Town Hall, Hull	Jan. 31
Overen - Board Schools - 720 Places and an Orchestra's House		Thomas Evans, 102, Cathedral-road, Cardiff	Jan. 31
Llandrindod Wells - Laying Out Recreation Ground, &c.		W. R. Meggs, Woodlands-road, Middlebrough	Jan. 31
Swainsea House	£50	Henry T. Hetherington, Clerk, 4, Birch, Northumberland	Jan. 31
Northampton - Playing Field cost £5,000, Billings-road	No limit; 23gs.	D. C. Davies, Clerk to Council, Llandrindod Wells	Jan. 31
Oxendon - Stanley-road Schools		James Daly, Acting Town Clerk, Llandrindod Wells	Jan. 31
Oxendon - Laboratorium cost £4,000. Abington-st.		J. Hayland, Clerk to Governors, 2 St. Giles-square, Northampton	Jan. 31
		J. Whitehead, Clerk to School Board, Chadderton, Oldham	Jan. 31
		Haviland, Clerk to Governors, 2 St. Giles-square, Northampton	Jan. 31

LIST OF TENDERS OPEN.

BUILDINGS

[illegible]

BUILDINGS—continued

their Broughton—Additions to Red Lion Inn
 Dovercourt—Nine Houses
 Elm—Lumber and Workshops, Manchester-st.
 York—Primitive Methodist Church and Schools, Monk-lane
 Point—Residence
 Middleton—Sheds, &c.
 Edgware—House, Canon's Park Estate
 Ware—House
 Micklegate, Pontefract—House and Shop
 Pontefract—Business Premises, Market-place
 Wakefield—Dale Works, Chapel and School
 Chortton-cum-Harby—Primitive Methodist Church
 Working Town—House, Mill-road
 Wakefield, Survey—Residence
 Wrexham—Drill Hall
 Leeds—Eight Schools—Houses
 Harrogate—Stabling at Ship Inn
 Bramhope—Workhouse Infirmary Buildings
 Bea-Whiting—House
 Hereford—New Premises
 Cardiff—Rebuilding of Duke-street
 Morley—Drying Sheds, &c.
 Barnsley—Business Premises, Market Hall
 Salebury—Bourgeois House and Store
 Melbury Tydall—Catholic Church
 Salisbury—Extension of High Pavement
 Cardiff—Alterations to Cory's corner
 Bookham—Kennels
 Salisbury—Leeds Weaving Shed
 Cranleigh—Cottages at Sewage-Disposal Works
 Stanley—Eight Houses
 Woking—Restoring the Warehouse, Working-street

T. Swinder
Sands and Walkers, Architects, Angel-road, Nottingham
R. U. Kestin, 1, Colchester-terrace, N.W.
A. Wilkins, Architects, 34, Tulkern-street, Luton
Frederick W. Dixon, Architect, Trevelyan Buildings, Manchester
James Young and Co., Architects, 53, Albert-street, Bradford
William Carter, Station-street, Meltham
M. M. Lawson, Architect, 40, Broadway, Ealing, W.
J. and A. O. Thorneycroft, Surveyors, Hammersmith
Garfield and Pennington, Architects, Epsom-park, Pontefract
Tennant and Bagshaw, Architects, Epsom-park, Pontefract
George Moxon, Architect, 26, Church-street, Burnley
Moulds and Porritt, Architects, 77, King-street, Manchester
Singer, Hyde, Manchester
H. G. Gurniball, Architect, Star Hill, Woking
M. M. Ormiston, A.R.I.B.A., Epsom-street, Wrexham
J. Harrison, 122, Bunde-street, Roundhay
H. E. and A. Brown, Architects, James-street, Harrogate
H. E. Lingen Broun, Architects, 18, St. John-street, Leeds
H. S. Fleming, Moorlands, Bingley, Yorks
W. W. Robinson, Architect, 10, King-street, Hereford
John Richards, Architect, 18, St. Mary-street, Cardiff
Wm. Ackroyd and Eves, Ltd., Morley, near Leeds
Geo. Mann, Architect, 10, St. Mary-street, Nottingham
John Harding and Son, Architects, 56, High-street, Salisbury
J. S. Hanson, Architect, 27, Alfred-place West, S. Kensington, S.W.
N. S. Bromley, Freval and Buildings, Queen-street, Cardiff
Jones, Richards & Budgen, Architects, 88, St. Mary-street, Cardiff
Charles Smith and Son, Architects, 88, St. Mary-street, Cardiff
C. Holthouse and Co., Architects, 82, Albion-street, Leeds
Edward L. Lunn, Surveyor, 36, High-street, Guildford
E. C. Crossland and Stanley, Inham House, Inham
Jones, Richards & Budgen, Architects, 50, St. Mary-street, Cardiff
Neah Rees and Sons.

ELECTRICAL PLANT

Stepney, E. — Lamp Columns, Fittings, and Switchboard.
 London, W. — Electric Light Carbons and Lamps (One Year).
 Newport, Mon. — Wincbes, Cables, &c.
 Boodle's — Wiring Town-Hall Extension.
 Dudley — Fireworks.
 Leyton — Dynamo, &c.
 Limerick — Electrical Plant, &c.
 Miford — Plant.
 Ashton-u-Lyne — Overhead Equipment for Electric Trains.
 Manchester — Plant.
 Backing — Electric Cars.
 Swindon — Machinery and Plant.
 Amsterdam — Electrical Conductors.
 Bury, Lancs. — Twenty-eight Electric Trains.
 Boulder City, W. — Electric Trolley — Electric Tramway (3 miles).
 East London, South Africa — Engine and Alternator (50kw.).

Borough Council	Arthur Wright, 27, Osborn-street, E.
Great Western Railway Co.	The Stores Superintendent's Office, Swindon
Bank of England	Mr. Marshall, 60, Abchurch-lane, S. E.
Electric Light Committee	The Borough Electricity Works, Pine-grove, Booter
Electric Lighting Committee	Ernest H. Wilson, 10, St. John's-street, S.W.
Urban District Council	Norman Lewis, Engineer, Cuthill-road, Leytonstone, Essex
Corporation	James Enright, 47, Queen Victoria-street, E.C.
Electricity Committee	W. C. G. Hawtrey, 10, Abchurch-lane, S. E.
Urban District Council	N. Applebe, Ben's' Elze, Engineer, Ashton-under-Lyne
Corporation	E. F. Metzer, Chief Engineer, Municipal Council, Manchester
Electricity Committee	F. Dawson, Public Office, Barking
Urban District Council	Lacey, Clireburgh, & Sillar, Esqrs., Queen Anne's-gate, Westminster
Corporation	Mr. Towne, Town Engineer, London, S.W.
Electricity Committee	Lacey, Clireburgh, & Sillar, Engineers, 78, King-st., Manchester
Urban District Council	The Office of the Deputy Municipal Agent, London, S.W.
Corporation	Mr. and Mrs. Municipal Agents, 7, Aldermanbury, E.C.

ENGINEERING.

Mounts—Steam Pipes, &c.
 Dead—Pumps, &c.
 Middleton and Kelsae—Wells
 Blackpool—Tramway Extension
 Halwell—Pipe, &c.
 Toughal—Heating and Ventilating Lunatic Asylum
 New Steel Llanymyneir
 Leigh—Deepening Well at Waterworks
 Warrington—Filters, &c.
 Llanymyneir—Clock Tower
 Pentre—Gas Mains
 Llanrhydy—Borehole, &c.
 Blackpool—Steam Expansion Pumping Engines
 Belfast—Renewing Roof over Passenger Station
 Olney—Reservoir, &c.
 Cambridge Heath, &c.—Steam Disinfecter
 Llyn—Sewer File Light Beacon
 Edinburgh—Waterworks
 Levenshale—Refuse Destructor Installation
 Oxford—Pumping Machinery
 Wimbledon—Settling Tanks, &c.
 Calcutta—Two Incinerators
 Sydney, New South Wales—Harbour Bridge
 St. Petersburg—Two Bridges over the Neva
 Partick—Hot-Water Meters
 Hot-Water Meters
 Donmalth School

Barrow-on-Urso Unit-Guardians	A. C. Meakin, Clerk, Union Offices, Mountsorrel
Dad and Walmer Joint Water Board	T. and C. Hawley, C.E.'s, Great George-street, Westminster, S.W.
Blything Rural District Council	H. Harold A. Morris, Clerk, Blything, Sussex
Corporation	F. W. F. Telford, E.C., Elec. Engineer, West Caroline-street, Blackpool.
Cork Looatic Asylum Committee	W. F. Loft, Architect, 10, High-street, Totnes
Urban District Council	Henry A. Cutler, M.C., 27, Municipal Buildings, Cork
Urban District Council	L. Edinger, Engineer, Public Works Office, Somerset
Corporation	E. F. Smee, Surveyor, 12, West Smithfield, E.C.
Rhonda Urban District Council	James Dean, A.M.I.C.E., Municipal Offices, Warrington
Corporation	Edward Hall, Building Contractor, Rhonda
Rhonda Urban District Council	Octavius Thomas, Engineer, Water Offices, Pontre, R.S.O., Glam.
Rural District Council	Bailey-Denton, Son, Lawford, and Symons, Engineers, Westminster
North Devon Railway Co. Guardians	J. H. Stubbis, A.C.E., 6, Victoria-street, Exmouth
Gt. Northern (Ireland) Railway Co. Urban District Council	The Engineer-in-Chief, Amiens-street Terminus, Dublin
Urban District Council	John Waugh, C.E.'s, Sandridge Chambers, Bradford
Conservancy Board	S. Thomas, Clerk, Gt. Northern Ry. Co., London
Edinburgh and Dist. Water Trustees	E. J. Silcock, M.I.C.E., Fussell Market-place, King's Lynn
Urban District Council	W. A. Tat, Engineer, 72, George-street, Edinburgh
Urban District Council	James Jepson, Engineer, 18, Levenshulme
Urban District Council	W. Harston, Surveyor, High-street, Dartford
Corporation	The Council Offices, Broadway, Wimbledon
New South Wales Government Municipality	Prest. Gundorf, Street, Levenshulme
School Board	The Agent-General for New South Wales, 9, Victoria-street, S.W.
	The Delegation Municipality, St. Petersburg
	H. B. Maxwell, Barrister-at-Law, 32, Clyde-street, Partick, N.E.
	M. P. Haynes, Architect, 1, Baginbun Buildings, Tilford

FENCING AND WALLS

Eastbourne—Boundary Walls, Sidley-road 20 20 20 20 20 20
Radcliffe—Stone Retaining Wall 20 20 20 20 20 20
Mountsorrel—Wall, &c., Bond-lane 20 20 20 20 20 20
Brentwood—Cemetery Wall, London-road.. 20 20 20 20 20 20
Oldham—Wrought-Iron Fencing and Stone Kerb 20 20 20 20 20 20
St. Aidan's-by-the-Sea—Sea-Wall 20 20 20 20 20 20

Highways and Drainage Committee..	R. M. Gloyne, A.M.I.C.E., Boro' Engineer, Town Hall, Eastbourne
Urban District Council	W. J. R. Hynes, Boro' Engineer, Town Council Offices, Radcliffe, Lancs
Urban District Council	G. H. Lee, Surveyor, Rothley
Urban District Council	J. E. Fotherdill, Surveyor, Town Hall, Brentwood, Essex
Park Committee.....	S. A. Pickering, A.M.I.C.E., Boro' Surveyor, Town Hall, Oldham
	F. H. Anson, Engineer, 15, Dean's-yard, Westminster, S.W.

FURNITURE AND FITTINGS

Donegal—Twenty Hospital Bedsteads.....
 Kingston-upon-Thames—Furnishing Workhouse Infirmary.....
 Newton Abbot—Furnishing New Board-Room.....
 Manchester—One Hundred Iron Bedsteads.....
 East Ham—Furnishing Napier-road New School.....
 Knaresborough—Repeating, &c., Wesleyan Chapel.....
 Tridion Grange—Furnishing Grange Literary Institute.....

Guardians	D. C. Pearson, Clerk, Donegal
Guardians	Jas. Edgell, Clerk, Coombe-road, Kingston-on-Thames
Guardians	S. Segar, F.I.A.S., Union-street, Newton Abbot
Joint Workhouse Committee	J. Macdonald, Clerk, New Bridge-street, Manchester
School Board	R. L. Curtis, 120, London Wall, City, E.C.
	G. F. Danby, Architect, 10, Park-row, Leeds
	J. Edmunds, Secretary, 20, Plantation, Trinidad Grange, Durham

PAINTING.

Buckie—House
East Preston—Workhouse Buildings
Clayton, Yorks—Workhouse Imbecile Wards
Leightonstone, Essex—Schools
Leeds—Poor-Law Offices, South Parade
Carlisle—Five Lockups

Guardians	D. and J. R. M'Millan, Architects, 211, Union-street, Aberdeen
North Bierley Union Guardians	H. Howard, F.S.I., Architect, Town Offices, Littlehampton
Bethnal Green Guardians	J. E. Helmsley, Clerk, 4, Town Hall-street, Bradford
Guardians	Holman & Goodham, Archts., 6, King's Bench-walk, Temple, E.C.
	J. H. Ford, Clerk, Poor-Law Offices, South Parade, Leeds
	Geo. Dale Oliver, County Architect, 5, Lowther-street, Carlisle

ROADS AND STREETS

Hoddeston—Kerbing, &c.
Edinburgh—Reconstructing Roads and Footpaths
Gloucester—Road Works
London—Making-up Roads
Maidenhead—Broad-street Extension, &c.
Berkhamstead—Making-up, &c., Doctor's Common-road
Tipton—Forming Broad-street
Bristol—Making-up Portion of South-street.
Oxleydon—Road Repairs
Bromley, Kent—Making-up Roads
Hastings—Making-up Roads, Two New Roads
Londonderry—Street Works
Stanley—Forming Private Streets
Dover—Widening Folkestone-road
Litham—Completing Passage in Fattersall-road
Enfield—Footpaths
Chingford—Making-up Pathways
Nottingham—Making-up Broad-road
Middletown—Paving, &c., Four Streets

Hertfordshire County Council	Urban A. Smith, County Surveyor, 41, Parliament-street, S.W.
Magistrates and Council	T. Hunter, W. S., Town Clerk, City Chambers, Edinburgh
Town Council	John A. M. I. C., County Surveyor, 10, St. James's Place, London
Clyde Navigation Trustees	James Paton, Borough Engineer, Municipal Offices, Plymouth
Devon County Council	W. M. Abston, Trussing Engineer, 10, Robert-street, Berkhampstead
Urban District Council	W. H. Jones, Surveyor, Owen-street, Tipton, Staffs.
Urban District Council	J. E. Pothergill, Surveyor, 10, St. John-street, Epsom
Urban District Council	The Borough Road Surveyor's Office, Town Hall, Croydon
Urban District Council	Fred H. Norman, Clerk, District Council Offices, Bromley
Urban District Council	W. Manning, Surveyor, 10, Ashford-street, Northfleet
Town Council	M. A. Robinson, C.E., Richmond-street, London-derry
Urban District Council	Routledge & Sons, Ltd., Surveyors, 10, Abchurch-lane, London
Urban District Council	H. E. Stilgoe, A.M.I.C.E., Borough Engineer, Town Hall, Dover
Urban District Council	B. Barton, Surveyor, 25, Sefton-road, Litherland
Urban District Council	Henry T. Walsley, Surveyor, 10, St. John-street, Westminster
Urban District Council	W. Stair, 14, The Parade, Chingford
Urban District Council	H. H. Prescott, A.M.I.C.E., Surveyor, 712, High-road, Tottenham
Urban District Council	W. Welburn, Borough Surveyor, Town Hall, Middleton, Lancs.

ROADS AND STREETS—continued.

Inver, Lanes—Making-up Private Streets
 Finney—Forming Footpath
 Loughsburg—Asphalt Pavement
 Aldershot—Forming, etc., New Road

Urban District Council
 Parish Council
 R. Simmonds

Winstanley and Ashworth, 42, Deansgate, Manchester
 Daw's Farm, Pinner
 Lionel Curtis, Acton Town Clerk, Johannesburg
 Friend and Lloyd, Architects, Grosvenor-road, Aldershot

SANITARY.

London—Drainage and Plumbing, Union Fever Hospital
 Greenock—Sewer, Upper Indragreen-street
 Darlington—Two Public Trunks
 Brentwood—Surface-Water Drain, Ongar-road
 Stamford, Essex—Sewage Works
 Killybeg—Culvert
 Richmond, Surrey—Sewers 500 yards
 Aston—Public Trunk
 West Hartlepool—York-road Intersecting Sewer
 Newhaven—Sewer, etc.
 Eastbourne—Two Public Conveniences
 Gosport—Drainage Works
 Darlington—Ladies' Lavatory in Covered Market
 Nelly—Sewer, etc., 42 yards
 St. Aidan's-by-the-Sea—Stoneware Sewer 200 yards
 St. Aidan's-by-the-Sea—Iron Sewer (33 yards)
 Twickenham—Sewers 1000 yards
 Huddersfield—Trunk—Sewage-Disposal Works
 Busby, Lancashire—Outfall Sewer 1,000 yards
 Falmouth—Concrete Sewers (6 miles)

Guardians
 Corporation
 Streets Committee
 Urban District Council
 District Council
 Town Council
 Urban District Council
 Corporation
 Urban District Council
 Pleasure Grounds Committee
 Urban District Council
 Markets Committee
 Urban District Council
 G. B. Fitzroy Cole
 Birmingham Rural District Council
 District Committee

M. A. Robinson, C. E., Richmond-street, London
 The Master of Works, Offices, Greenock
 H. G. Stevenson, Town Clerk, Hounderside, Darlington
 J. E. Fothergill, Surveyor, Town Hall, Brentwood, Essex
 J. Watts, Surveyor, Town Hall, Stamford
 Kieran Comerford, Clerk, Killybeg
 J. H. Bentley, Borough Surveyor, Town Hall, Richmond, Surrey
 G. H. Jack, Surveyor, Council House, Albert-road, Aston Manor
 J. W. Brown, Borough Engineer, West Hartlepool
 F. J. Rayner, Town Surveyor, Newhaven, Sussex
 R. M. Glynne, A.M.I.C.E., Borough Engineer, Town Hall, Eastbourne
 Herbert Frost, Engineer, Council Offices, High-street, Gosport
 The Borough Surveyor's Office, Town Hall, Darlington
 James McE. Gray, A.M.I.C.E., Town Clerk, Town Hall, Selby, Yorks
 P. H. Anson, Engineer, 15, Dean-street, Westminster, S.W.
 P. H. Anson, Engineer, 15, Dean-street, Westminster, S.W.
 George F. Sharpe, St. George's Lane, W.4
 W. H. Bradford, C.E., Albion Chambers, King-street, Nottingham
 W. H. Bradford, C.E., 3, Clydesdale-street, Hamilton
 Walter Durrant, Rockdale, Falmouth

STEEL AND IRON.

Covertry—Cast-Iron Pipes (67 tons)
 Ramsgate—Water-Pipes 450 to 500 18in.
 Killybeg—Cast-Iron Pipes, etc.
 Llandudno—Steel Rails (9,000 tons)
 Llandudno—Cast-Iron Pipes and Specials
 Boleyn—Iron Escape-Material at Warkworth House
 Edinburgh—Cast-Iron Pipes (2,000 tons)
 London, S.W.—Steel Rails (4,715 tons), Fishplates (430 tons)
 Amsterdam—Steel and Iron Goods, etc.

Corporation
 Corporation
 War Department
 Norwegian State Railways
 Urban District Council
 Belfast Union Dock Company
 Edinburgh and District Water Trustees
 Netherlands Minister of Commerce

J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry
 William A. McIntosh Valon, Engineer, Ramsgate
 The Board Engineer Office, Ferny, Ireland
 The Railway Manager's Office, Christiansia
 E. G. Stephenson, A.M.I.C.E., Eng. Council Offices, Llandudno
 J. Ward, Architect, Birmingham
 W. A. Traill, Engineer, 72a, George-street, Edinburgh
 The Agent-General for Victoria, 15, Victoria-street, S.W.
 Mart. Nyhoff, 15, Nobelstrat, The Hague

STORES.

London, W.—Bricks, Cement, Stone, Slates, &c. (One Year)
 Shropshire—Road Materials
 London, W.—Oils, Colours, Paints, Varnishes, &c. (One Year)
 Ramsgate—Water-Pipes (18in., 500)
 Christiansia—Steel Rails (9,000 tons)
 London, W.—Sanitary Ware and Fittings (One Year)
 Bradford—Valvanized Iron Ducts (250) and Covers
 Churley—Line 450 tons
 Thrayfield—Broken Granite (200 tons of 14in.)
 Wellington—Ironwork One Year
 Blackpool—Trap or Granite Stone (9,000 tons)
 Christiansia—Various Oils
 Johannesburg—Wood Tannet Blocks (27,000)
 Manchester—Dressed Grit-Crossing Setts (600 tons)
 Greenock—Cement, Bricks, &c. (Six Months)

Great Western Railway Co.
 Urban District Council
 Great Western Railway Co.
 Corporation
 Great Western Railway Co.
 Great Western Railway Co.
 Gas Committee
 Urban District Council
 Urban District Council
 Norwegian State Railways
 Highways Committee
 Electricity Department

The Stores Superintendent's Office, Swindon
 F. Perry, Surveyor, Trinity-road, Shropshire
 The Stores Superintendent's Office, Swindon
 W. A. McIntosh Valon, Engineer, Ramsgate
 The Stores Superintendent's Office, Swindon
 The Stores Superintendent's Office, Swindon
 F. Stevens, Town Clerk, Town Hall, Bradford
 J. Allen, Gas Engineer, Churley, Lancs.
 F. Gregson, Clerk, Southend-on-Sea
 J. T. Parker, Clerk, 29, Church-street, Wellington
 John S. Brodie, Borough Engineer, Town Hall, Blackpool
 The Manager, Engineering Dept., State Railways, Christiansia
 J. Ward, Architect, Birmingham
 The Chief Clerk, Town Hall, Manchester
 W. M. Nelson,burgh Electrical Engineer, Greenock

TENDERS.

* * * Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BATHS.—For laying the permanent way of improved electric railways, for the town council:—
 Graham Brothers, Huddersfield £30,000 0 0
 Accepted.

BODENHAM.—For carrying out the East-the-Water drain-scheme for the Urban District Council:—
 Lester, J. E. & T. Frymouth £3,985 0 0
 Bains, J. and T. Frymouth 2,745 15 5
 Scott, R. B., Plymouth 2,624 0 0
 Wood, S., Bristol 2,616 17 4
 Dart and Dillard, Paignton 2,607 13 7
 Byrman 2,583 18 10
 Ellis and Son, E., Bideford* 2,316 15 6
 * Accepted.

BRENTFORD.—For the erection of a new central board shed at Brentford. Accepted tenders:—

Sampson & Siddall, Brighthelm £12,500 0 0
 Ingham, Hillingworth & Co., Leeds 552 0 0
 Hesting
 Everingham 403 0 0

Bristol.—For structural alterations at the Temple Back electrical station, for the city council:—
 Hayes, C. A., Bristol accepted.

BRISTOL.—For public bath, for city corporation. Mr. W. S. Skinner, Bristol, architect:—
 Beaven, A. J. (accepted) ... about £17,000 0 0

BRISTOL.—For works of decoration in the new board-room and offices, for the board of guardians:—
 Dettick, E. B., and Co., Denmark
 avenue, Bristol, accepted) ... £185 7 0

BURY ST. EDMUNDS.—For building new operating theatre and other works at the Suffolk General Hospital. Mr. H. Percy Adams, F.R.I.B.A., 28, Woburn-place, Russell-square, London, architect:—
 Shillito, Bury St. Edmunds ... £22,200 0 0
 Accepted.

BURY ST. EDMUNDS.—For electric wiring and fittings, for the Suffolk General Hospital. Mr. H. Percy Adams, F.R.I.B.A., 28, Woburn-place, Russell-square, London, Hall and Huchuck, Ipswich, 241 R 7 4
 Accepted.

BURY ST. EDMUNDS.—For building boiler-house and chimney stack, alterations to laundry, boilers, pumping, and laundry machinery, &c., at the Thynne Union, for the Thynne Board of Guardians, Mr. H. Percy Adams, F.R.I.B.A., 28, Woburn-place, Russell-square, London, architect:—
 Gough and Co., Hendon (accepted) £2,334 0 0

CHARD, SOMERSET.—For the erection of stores, offices, and a warehouse for the Somerset Trading Co., Ltd. Mr. Arthur W. Young, architect:—
 Harris and Woolcott (accepted) ... £1,300 0 0

COMBARTON, N. DEVON.—For the erection of a dwelling house, for Mr. W. H. Lerrwill. Mr. Allen T. Hulse, M.S.A., Hiramcombe, architect:—

Burgess
 Lovering, R. ... 335 0 0
 Culliford ... 329 10 0
 Dillman, W. C. ... 272 0 0
 Darch, M., Combarton (accepted) 210 0 0

COWES.—For the supply of ironwork for a retort shed at the gasworks, for the town council:—
 Accepted ... £70 0 0

ELLENBERIE.—For new redbait-beds at the gasworks, for the urban district council:—
 Drake, J., & Son, Gwent, Halifax £1,005 0 0
 Accepted.

HORTON.—For extending engineering works and fence at the epileptic colony, for the London County Council. Accepted tenders:—

Electric-light installation:—
 Benham and Sons, Ltd. 46,252 15 7
 Ballois, pumps, and fittings:—
 Babcock and Wilcox, Ltd. ... 1,170 0 0
 Fencing:—
 Mulford, R. ... 1,032 0 0

Cooking apparatus:—
 Moorwood, Sons, and Co., Ltd. ... 918 0 0
 (Total of accepted tenders, £9,313. Architect's estimate, £9,150.)

H. YOTG & CO. LD

STEEL AND WROUGHT IRON CONSTRUCTIONAL WORK.

Rolled Joists, Angles, Plates, Tees, &c., in Stock.

RIVETTED GIRDERS & CAST IRON

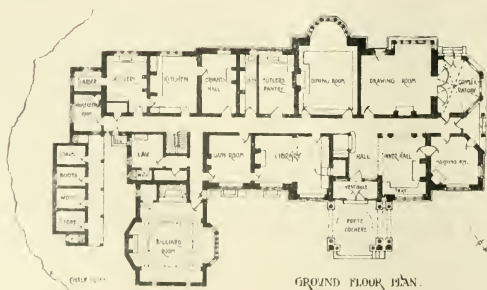
OF ALL DESCRIPTIONS

MADE IN LONDON.

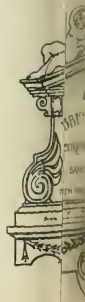
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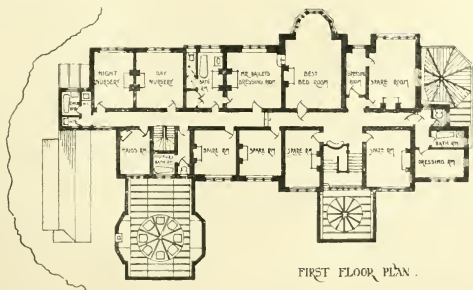
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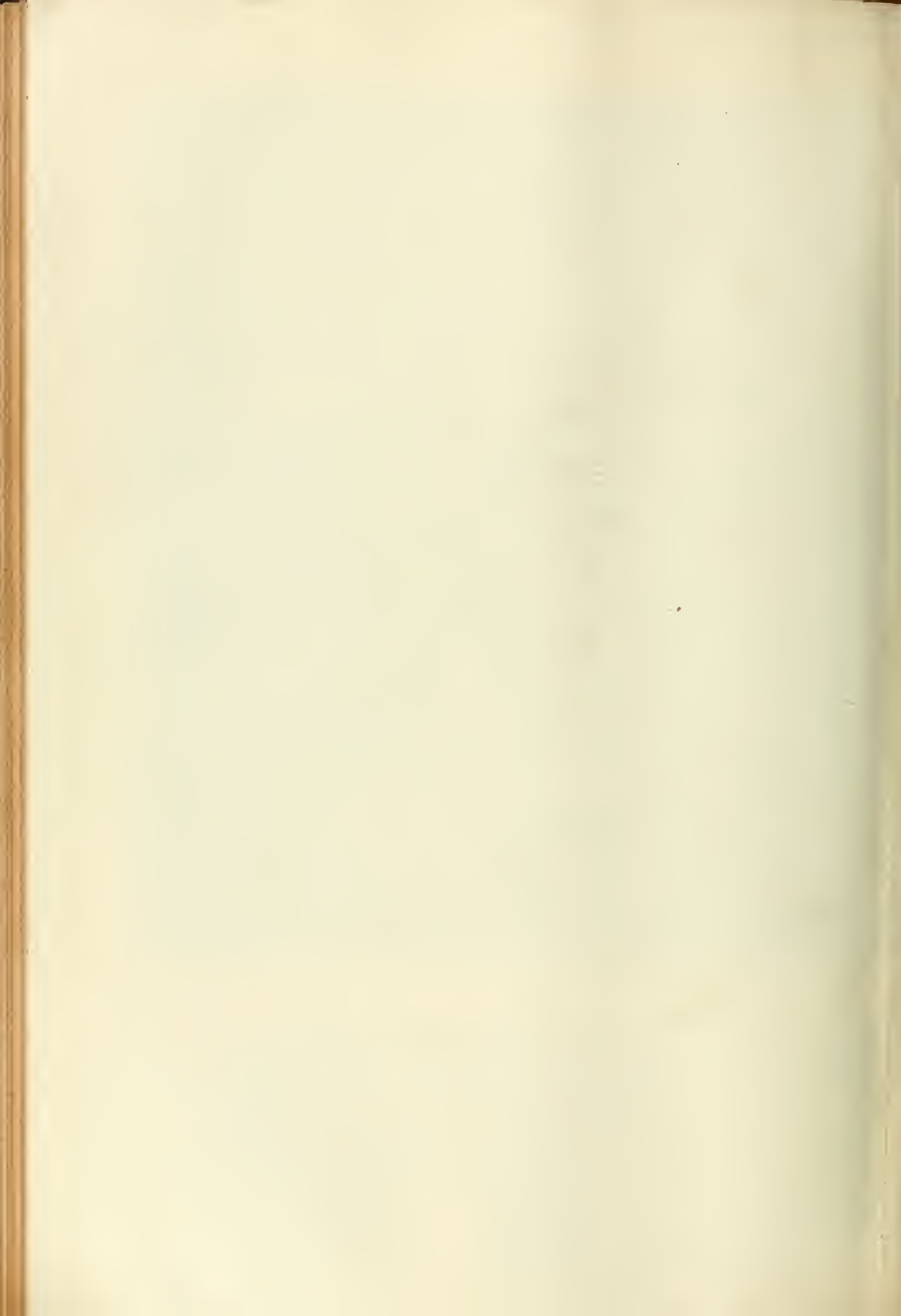


GROUND FLOOR PLAN.





FIRST FLOOR PLAN.











NEW BANK OF LIVERPOOL, CHESTER.

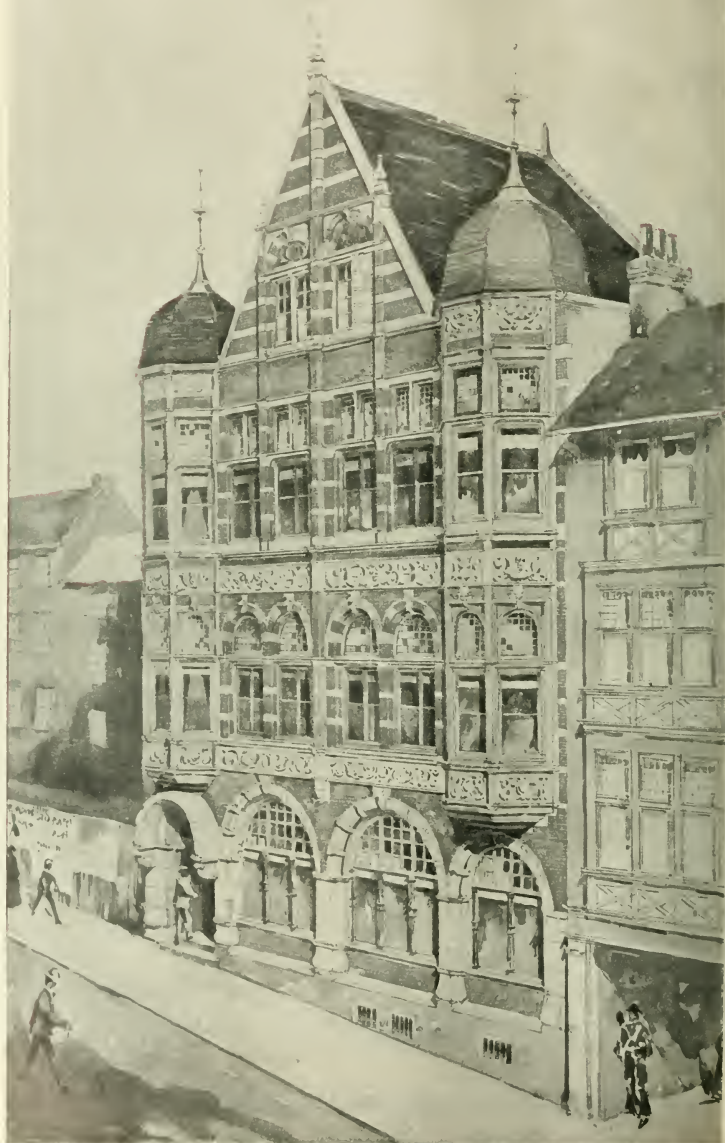
J. DOUGLAS AND MINSHULL, ARCHITECTS.

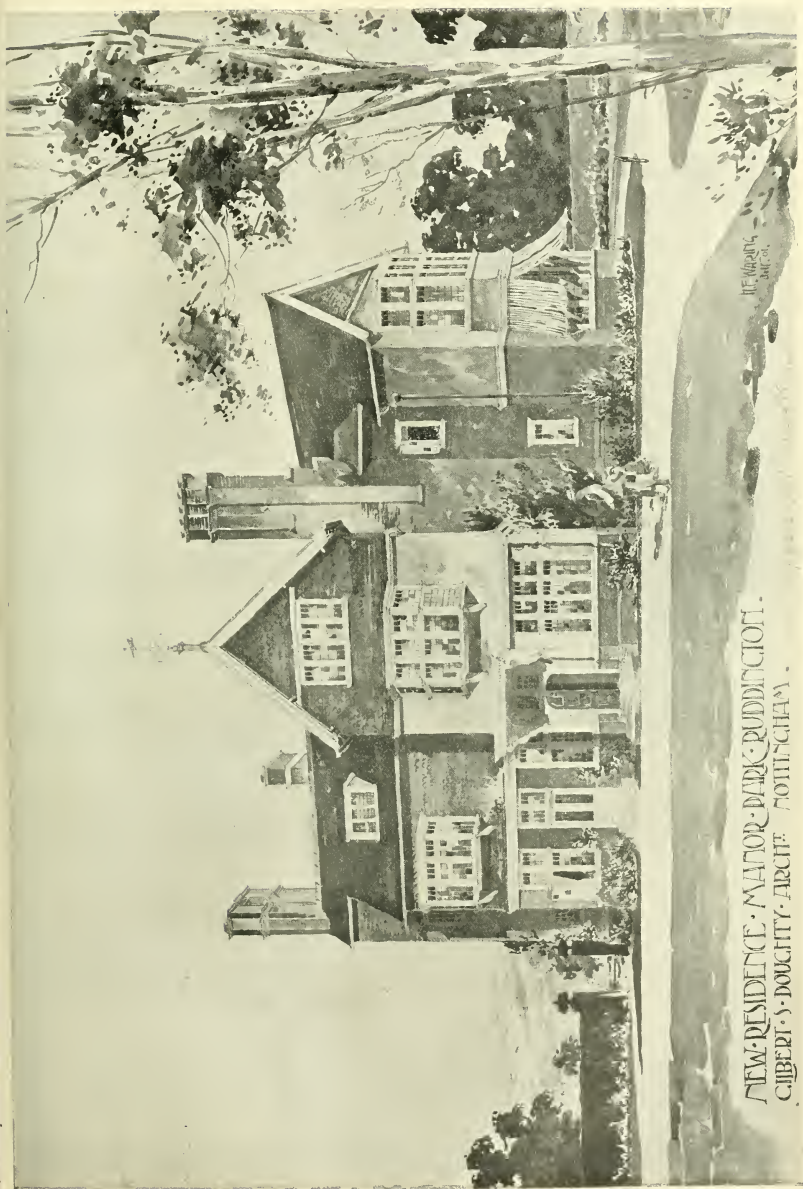
The London Scottish Engraving Co., Ltd.



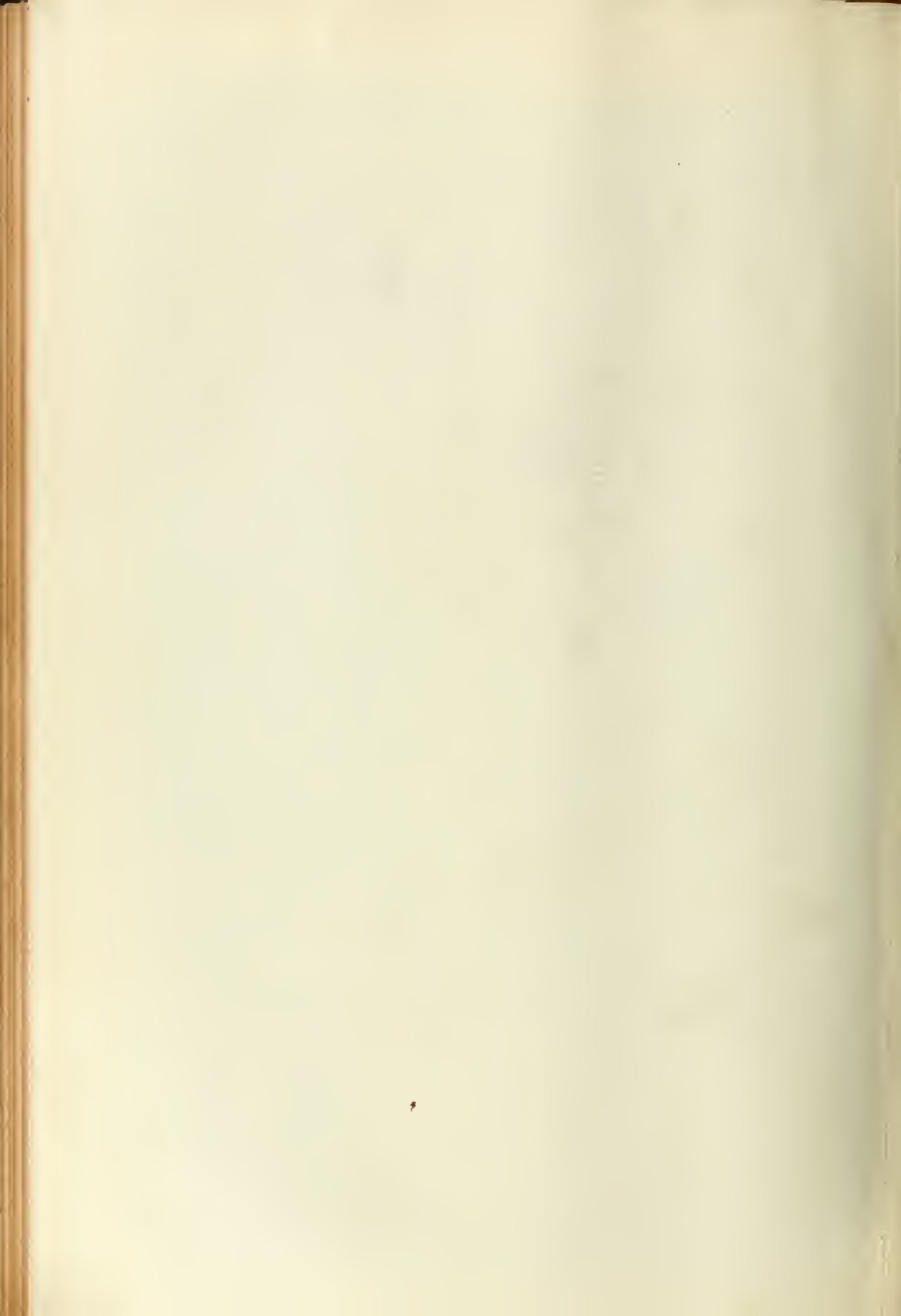
THE BOROUGH CLUB - NOTTINGHAM.

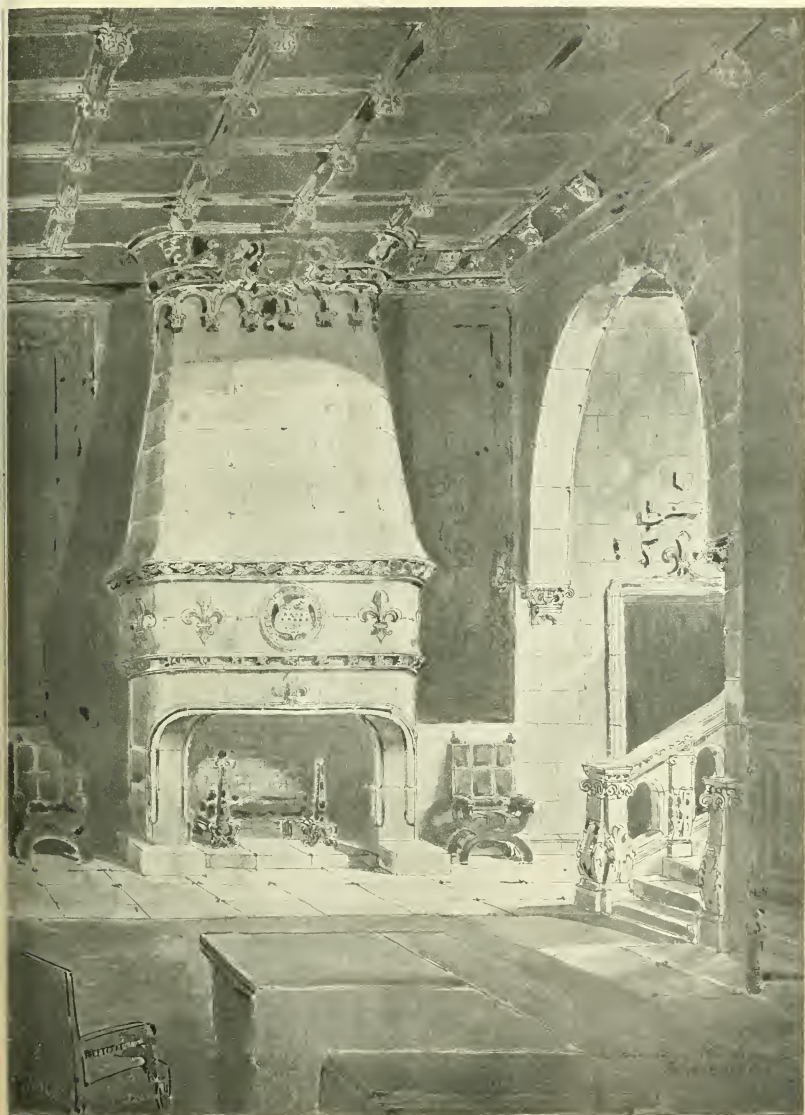
CIBERT & DOUGHTY ARCHT. NOTTINGHAM.



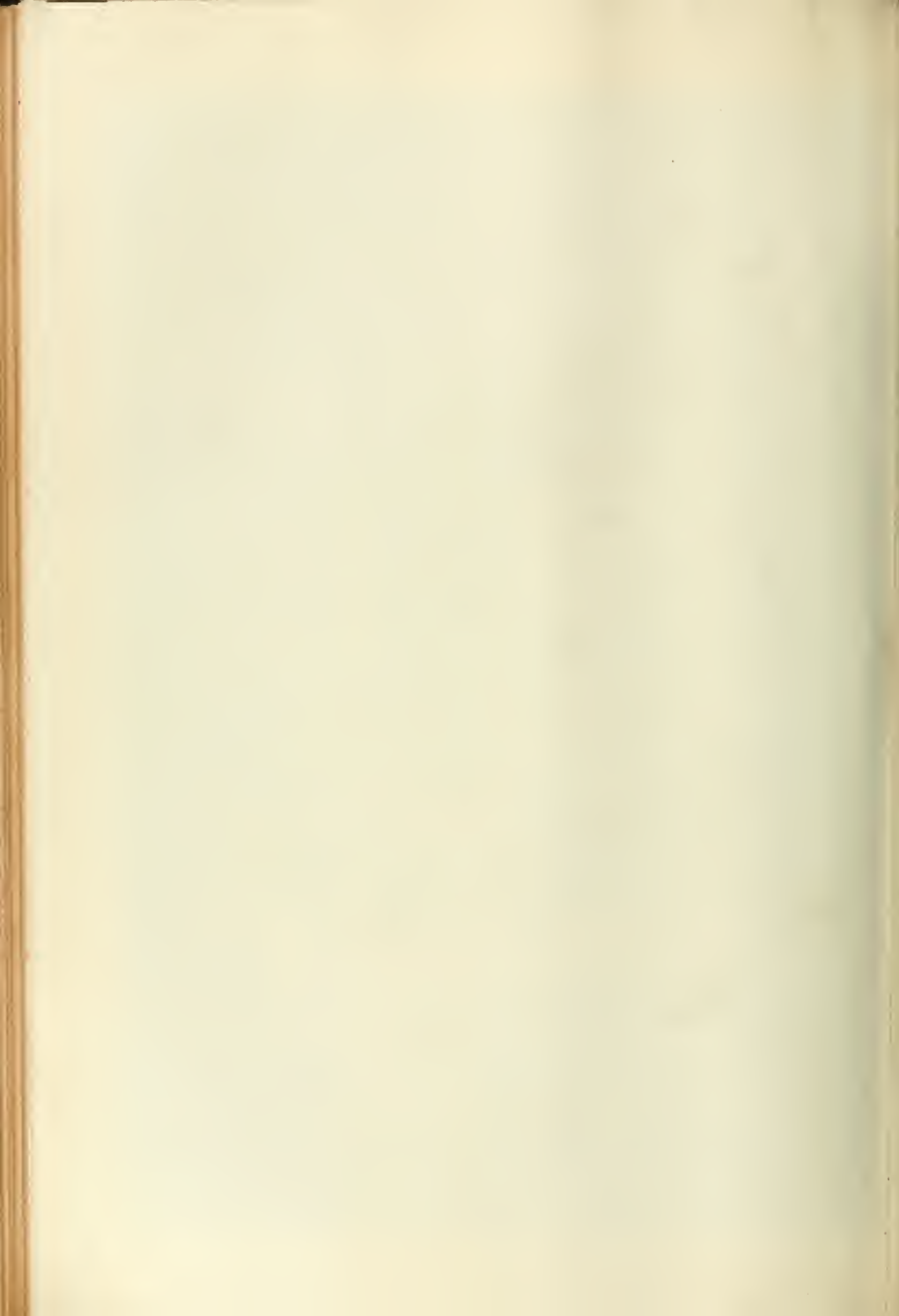


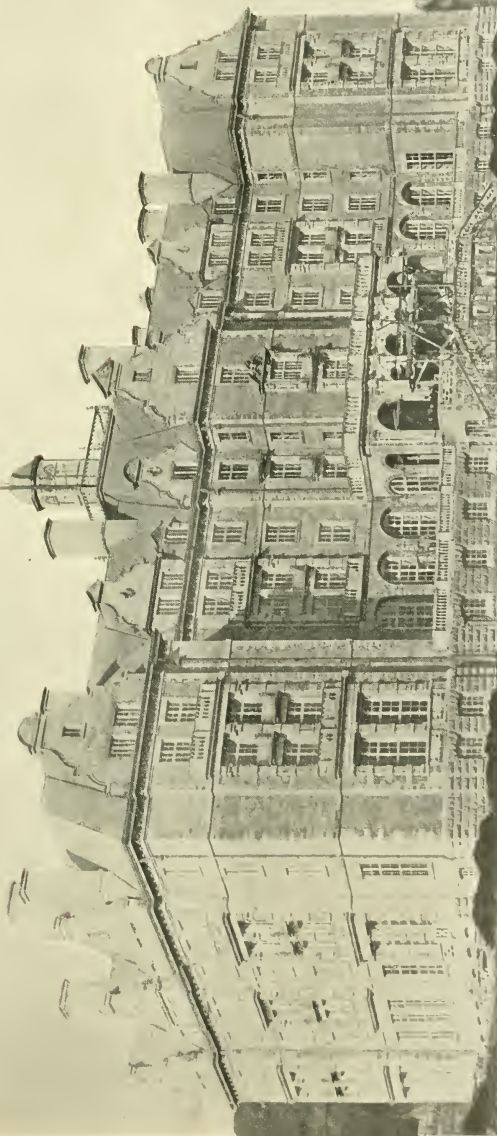
NEW RESIDENCE, MAJOR D. R. PUDINGTON.
GILBERT & DOUGHTY, ARCHT. NOTTINGHAM.



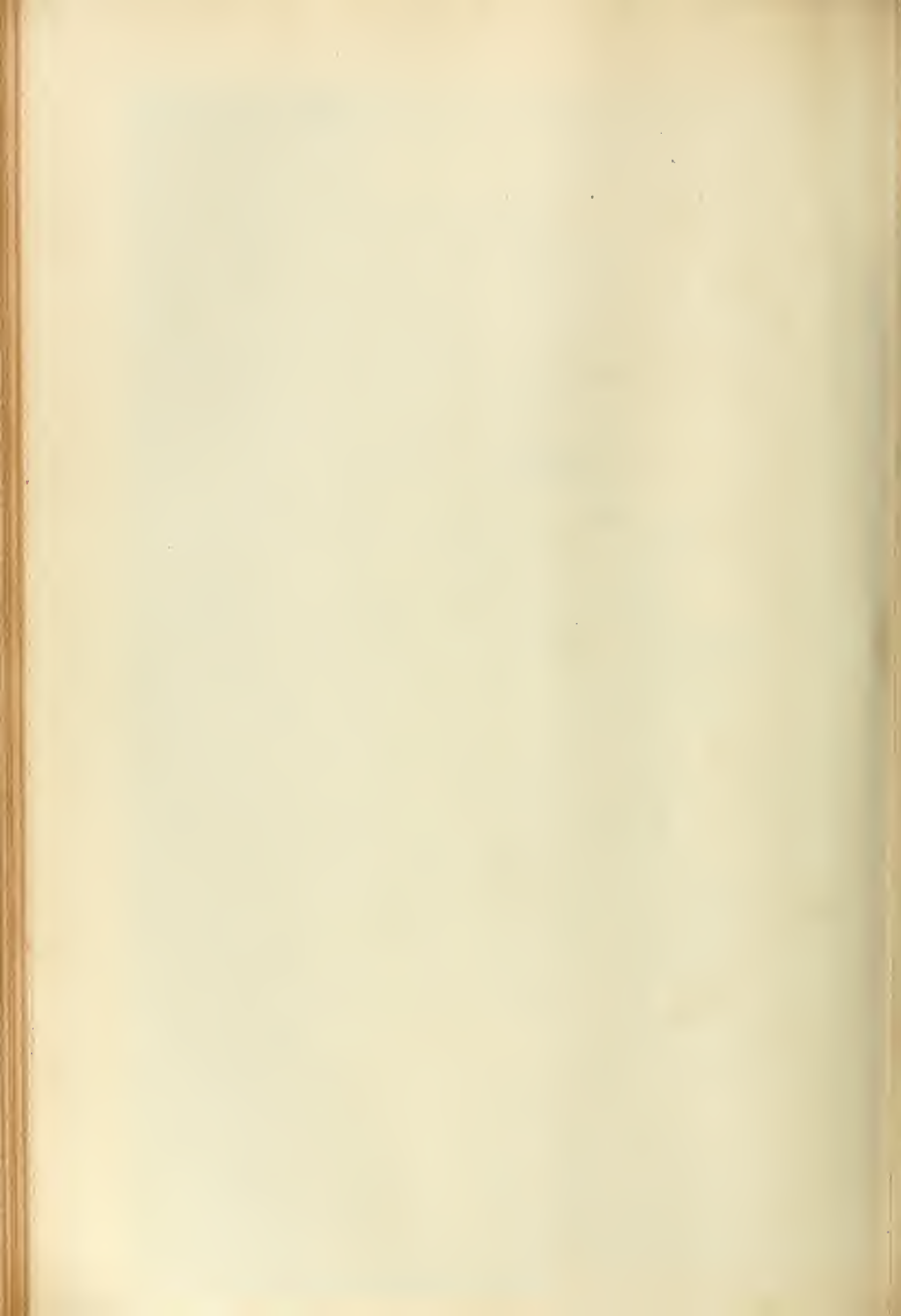


HALL INTERIOR AT EGHAM. EXECUTED FOR E.W. BECKETT & SONS, LTD.





NEW HOTEL, BUXTON, DERBY.
THOS. GARNER, ARCHITECT.



THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXXXI.—No. 2442.

FRIDAY, OCTOBER 25, 1901.

THE OPENING SESSION.

THE addresses of the Presidents of the architectural societies usually deal, somewhat superficially of course, with a variety of subjects of interest to the profession. The address by Mr. W. Howard South-Smith, before the Architectural Association, of which we gave a report last week, may be taken first. The main staple is the question of the education of architects, and the remarks are worth attention from all students. The Association has done much in the cause, and the President refers to the fact that the list of visitors to the School of Design includes the names of the best London architects who are giving their time in teaching, and mentions that the new advising council contains the names of all the architect members of the Royal Academies in the United Kingdom. The desire to enter the R.I.B.A. examination lists after only a few months' preparation by students is one of the mischievous results of the system of education in force. As Mr. South-Smith says, it means cramming, the consequence of a neglected education, and he hopes the Association will not be a party to this sort of education. We hope not. Cramming can never teach architecture in the true sense, for it means forcing into a man's brain a number of studies he cannot make his own, and which he will not require for his professional work. We lately noticed the remarks made by Sir John Gorst the other day in speaking of elementary education, when he showed that no "capacity-catching machine" has been invented which works well. "It lets go some it ought to keep, and it keeps others it ought to let go." It is the smartest and shallowest who succeed, while the dunce of the school often becomes the profound thinker of later life. These are the experiences of all. The present plan of class instruction fails in the elementary grounding of the student. The President refers to Mr. Lethaby's thoughtful paper on "Education in Building," which recommends a more practical study, and co-operation between architect and mechanic, and a higher standard of execution; but we must emphasise more the distinction between "Professionalism" and honest architecture. We cannot have both. One endeavours to make a man an architect by external pressure—by forcing him to become expert in various branches of the profession, like valuations, dilapidations, &c. The other encourages the development of special gifts. It is satisfactory to find the address advocates a protection for architects which is at least akin to registration, though this term is avoided. Mr. South-Smith refers to the law just passed in California, and the consensus of opinion in the provinces. The Institute's policy since the establishment of the examinations is admitted to be "incomprehensible and illogical, excepting as based on this principle," an important admission as to the necessity for Registration. The profession will never be adequately protected from the charlatan and incompetent till the State confers upon the properly-qualified man the right to practise, and the standard of qualification demanded should be confined primarily to building and hygiene, so that the gifted artist may not find himself ousted by an examination that demands passing in a number of other branches of science that are outside his real capacity. A diploma or certificate, based on an examination of a comprehensive kind, would be a mistake, and defeat the ends of justice; for a comparatively few more

would comply with the Act, but practise in other clandestine ways by evading the law.

Another question that will no doubt receive attention is the Liverpool Cathedral scheme. The official invitation to architects which we noticed in our issue for Oct. 4th will set many architects to work, if not thinking of the best mode of giving expression to their ideas. The question of style is important. The deputation which waited upon the executive committee from the Liverpool Architectural Society very reasonably recommended that the style should be left open, instead of being confined to Gothic, thus opening a larger field of talent. We do not say that Gothic is not best; but there is a large number of able men in the profession who, as the President of the Society suggested in his Presidential address, are seeking development in other directions, and who therefore will not compete, or if they do, it will be under adverse conditions. The President, Prof. Simpson, was also expressing the view of many of the ablest Gothicists in the right sense when he observed that Medieval detail was often regarded as constituting the Gothic style, but that "construction, not detail, made a style." What is generally understood by a Gothic building is one replete with the features and details common to the ages which produced the style, instead of those principles of design and construction which distinguished it, and which are just as applicable to a domed building as to one with central tower and spire. We have so long taken the external details of style to represent the characteristic of the style itself—the result for the method that such a mistake is pardonable in competition promoters and committees. If, as the President said, "the committee were content to depart from the recognised forms of ornamentation hitherto deemed obligatory, and to allow the architect who designed, and the other artists who assisted, a free hand in plain ornament and detail, then possibly a building could be produced suitable to modern requirements, and yet Gothic in the true sense of the word." But by conventional Gothic as generally meant, the competitors would submit designs of all degrees of merit without taking advantage of a great and unique opportunity since the time of Wren that of adapting the principles of the style to modern conditions of church building.

A correspondence has been going on in the *Times* about the question of style. Mr. Gladstone says that Gothic is the only possible style for a cathedral, and in a recent letter points out the absurdity of selecting a model from any ancient Classic building like the Baths of Caracalla at Rome, and also the unsuitability of Italian models for a large church. Mr. Reginald Blomfield joins issue with him, and condemns the action of the Cathedral Committee in restricting the designs to Gothic or any style. He asks why the style should be selected, when the world of styles is open, and whether there is any sincerity of expression in producing a dead language, though we imagine Italian is quite as much open to the charge. Another letter from Mr. C. H. Reilly takes the same view; he refers to the younger men of the day who are forming a style, and who are "articulating to the needs and ideals of the present day the style that was inaugurated with the beginnings of modern life and thought in Italy at the Renaissance, and developed by the great English architects of the 17th and 18th centuries—men like Mr. Norman Shaw, Mr. Belcher, Professor Beresford Pile, Mr. Richards, and others," and he challenges the assertion that if the style was left open nine-tenths of the designs for the new cathedral would be Gothic. Another writer asks why Gothic should be called the only dead style, and how it differs in this respect from the Greek, Roman, or Renaissance. These at least show that the Battle of the Styles is

not entirely defunct; that questions of style still divide the profession when any important building is discussed. The traditions of Liverpool are certainly rather Classic than Gothic; but the question is, What is Gothic? The letters of Mr. Emerson and Mr. Jackson supply the only reply. The motives by which our forefathers evolved the Gothic give us the true answer, and that is working in the spirit independent of precedent, but conforming to conditions of locality and material.

The Liverpool Architectural Society also suggested certain points as to the conditions, one of which was unlimited competition, open to all English architects and divided into preliminary and final stages, a plan that has been found to work well, and to assist architects in the development of their ideas. They also recommended the appointment of three assessors, representing different schools of architecture, to draw up the instructions and select designs for the final contest; that the question of style should be left open, and the successful competitor should carry out the work. These recommendations are reasonable. The one-assessor appointment has not given universal satisfaction, simply because he represents one school of thought, or is not in sympathy with the younger or more advanced members of the profession. If an expert, as he often is, in the particular branch, he is inclined to favour a particular system, or plan, or style. As a judge of style or architectural merit, indeed, he may be quite at sea.

The opening address of Mr. Alfred Darbyshire at the Manchester Society of Architects, reported in our last issue, reviewed the present condition of architecture, and contrasted it with that of the early part of the last century. The President spoke of the difficulties that an architect had to encounter; probably he meant in regard to the want of a system of education, the lack of schools, the struggle between partisans of Classic and Gothic. The Classic forms began to be regarded as a tyranny, and architects tried to throw off the shackles of the Five Orders. No doubt this exercised a retarding influence for a time, for few men were prepared to adopt Gothic. The opening of schools of art aided in the work, and brought forward a new school of architects. To Edward Walters Manchester owed much in this direction: he struck a death-blow to the old school, and inaugurated a new one in civic architecture. From henceforth Manchester put on the garb of the Italian Renaissance. Though we cannot say this was a style appropriate to the industries, climate, and skies of Manchester, it was at least a step in the right direction. The President also pointed out the effect of competition, the commercial point of view in which architecture was held. All sympathy with sentimental conditions which formerly existed has disappeared. A school of art designed by a living author required alteration or enlargement, it was now given to a stranger without the slightest compunction. But it was not so formerly;—the original designer was consulted. Mr. Darbyshire also touched on the hopelessness of open competition, in which men threw away their brains and money in attempting to win a prize; on the decision of the corporation to establish a municipal office of architecture, and to elect a city architect. Was this new official to control the architectural development of the City, or was the office to undertake the design of all public buildings for the Corporation? If the former, the appointment would demand an official of great ability and artistic culture; if the latter, the profession in the City would suffer. Another subject discussed was the establishment of a chair of architecture at Owens College; but we refer the reader to the address. A school of architecture in Manchester, as that of Liverpool, would be an influence that would be felt, and it would be a goad aid if the co-operation

of the College could be secured in the way suggested. On the whole, there is a prevailing desire to develop and widen the facilities for architectural education; to point out the defects of the present system, and this is the keynote of most of the presidential addresses.

PROFESSIONAL AUTHORITY.

INSTEAD of the "Five Orders" and the Precepts of Vitruvius, that at no very distant date formed the basis of the profession of architecture, and gave it a certain degree of coherency in the eyes of the public, there is now a rather hazy idea that there is no solid basis beyond that of building what you like, in any "style" you choose. We are afraid this view has been instrumental in undermining what may be called the authority in architecture. In other professions there is less danger of this. The profession of medicine is founded on accurate knowledge of facts; the engineer is controlled by inexorable physical laws; but the architect is supposed to be exempted from all law or principle, and his profession not to depend on any knowledge of a practical kind. In his address to the medical practitioners assembled at St. Paul's known as the Guild of St. Luke, Canon Gore said the medical profession had to mediate between a world of accurate knowledge and the common, rough, practical life of men—it was a science of invention. "I cannot see that there is any special reason why the architectural profession? There would be some hope of a more general recognition of the architect in the minds of the public if it could be affirmed that he was the mediator between physical law and requirements and the aesthetic: between utility and the laws that govern beauty in the material world. Yet the architect ought to hold that position; his art and skill are directed to the task of converting the products of nature—stone, timber, iron, and other materials of building—the conversion of the requirements of life into pleasing and agreeable structures, in turning the useful into the beautiful. But the public are ignorant of his work and art; the theme of architecture and professional education only comes before the societies, and as the architect is not certificated or registered before he practises, the general opinion is strengthened in spite of mystic letters after his name. The profession themselves do little to remove popular impressions as to the extra cost of architects' work, and neglect of matters which give a handle for all kinds of false conclusions. Before the profession can be looked upon as an authoritative body on building, they must show themselves able to constrict as well or better than any builder; to arrange plans that are unimpeachable in their convenience and comfort; to arrange schemes of decoration that will not defy or contradict principles of art. We have heard the architect's plans contemned or criticised for mistakes of the most rudimentary kind, such as the wrong position of doors and windows and fireplaces, want of stair headway or room to carry up furniture like a large wardrobe, for passages and corridors that are too narrow for the conveyance of goods, or ill-lighted; for bad lighting to staircases, chimneys that would not draw, bad ventilation, and the like. "Can we be surprised if builders and amateurs discover these shortcomings, and affect to sneer at the architect's work? It is common to have blunders in construction pointed to, such as a weak roof or girder that has caused damage by settlement and cracking of plaster, a weak arch, or bad foundations. These are always very sorry admissions to have to make when there is any ground; but are they not often made to damage the profession? Are they made with any knowledge of the circumstances? A little inquiry will reveal the fact that the plans

were cut down to suit the client, the staircase and passages reduced; the girder was not of the specified dimensions, the positions of windows and fireplaces altered to the client's wishes. A considerable abatement of the list of errors in design can thus be made, and the rest have been due to a troublesome and evasive contractor, who has taken advantage of the architect's absence.

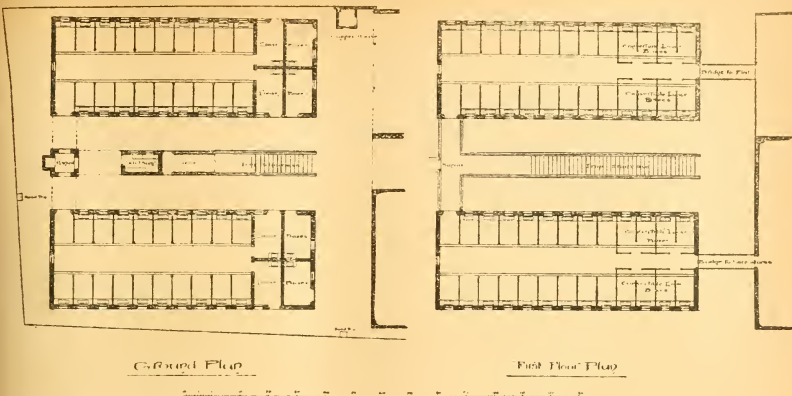
But it will be asked: Why should these infractions have been permitted? The question occurs: Should the architect sanction such alterations or modifications of his design? We are afraid some of them have been permitted without any protest: he has not thought it worth his while to object to little deviations of plan, although they have far-reaching consequences—such as that of shifting a door or a window; he has also allowed tradesmen—the iron merchant, for instance—to reduce the size of iron beams, the engineer to suggest an alteration in the design for the heating or lift arrangements, or other arrangements in the structure.

There is a want of recognised authority in matters of architecture and building as there is in many other matters—in theology, for example. People are found who, in spite of their lack of education and knowledge, will take their own course, and dictate on questions of art as if they were matters of common or popular knowledge, and with as little compunction as men decide for themselves their religion or mode of worship. Perfect freedom, of course, is one of the prerogatives of Englishmen, and individualism is just now very much to the front, despite its drawbacks; a man can think and do just what he pleases—very often to the inconvenience of other people who are more disciplined and restrained than himself. Thus we find owners of buildings defiant of their neighbours, erecting buildings or heightening their premises to the obscuration of the light and convenience of others, without consulting the feelings and interests of those concerned by their neighbours. Any professional man in the preparation of their plans; others who with a self-satisfied reliance on their own knowledge of building, dispense with an architect; builders and building tradesmen setting up their opinions in opposition to those who have devoted their lives to art. Even on questions like ventilation we find people ignorant of the laws of heat or of the movements of air currents deciding for themselves as to the method to be used in ventilating a building by using the most absurd appliances. And passing from scientific matters to questions of art, we all have painful experience of the monstrosities and glaring mistakes made by those who imagine they can decide for themselves on questions of architecture, decoration, or colour. People of this kind have no definite knowledge of art in any form; they imagine it is a question of fancy or of individual taste, just as they decide on matters of religion or questions of politics. There is the appeal to history and precedent, and there is the appeal to construction and modern requirements; but the ordinary amateur takes only what he likes, and rejects all else, regardless of anything except his own personal taste. With such a mind it is only a matter of what he likes: he does not consider those who visit his house, or participate in his expenditure in art or decoration; it is exaggerated individualism that is paramount in such men, and their houses or building premises become a reflex of the man's mind. This is not the catholic sense of art that we have been instructed to admire in the past, which depends on tradition, upon certain rules and principles, and which is successful on account of its unselfishness and easily-understood appeal to home requirements and emotions. In the early Victorian era it was customary, if a man wanted to build, to consult an architect who had learned his profession, or who had acquired a special knowledge of a particu-

lar building, and to commission him to prepare designs; in those days the owner buys or rents the house that he thinks suitable, without asking any questions or obtaining the services of a competent surveyor to examine the construction and sanitary condition. If it is a large public building, instead of going to a specialist the building is thrown open to competition, under the belief that expense is saved, or that architectural ability is a commercial question. Again, the commercial firm of art manufacturers is consulted before the architect for decoration, painting, or wall-papers, and a selection is made of a design or scheme of colour that sets all rules of art at variance. Imagine the scheme for a vestibule or interior of a restaurant. It is proposed to be carried out in decorative faience; and a manufacturer of faience is consulted. A design is prepared that looks well in the sketch. The architect blandly harmonises, but the actual work when it comes to be finished looks harsh and crude. The colour scheme has not been adhered to. But the architect has been ignored. A member of the committee or the client determines upon the material, and, having decided upon it, thinks it better to place the design in the hands of the firm. The architect, perhaps, objects, but is overruled. In one case we hear of the architect's scheme of colour for painting the woodwork of a large building entirely set aside by the building committee, among whom is found an artist member who knows a great deal about painting, and they agree to his taste being followed. This sort of thing is increasing. Architects find their authority on questions of art very much underrated by their clients, who prefer their own taste—possibly very atrocious, and insist on having their wishes carried out: in a few cases authority in these matters is questioned by art firms who have some particular application of ornament or colour to a building. Some art firms may sometimes know better about ornament than the architect. If so, so much the worse for the architect, for it indicates that he has not kept up to the standard required. Excellent work is turned out by manufacturers, and it is this excellence in the design and execution that has made the profession willing to accept the stock patterns and designs of large firms, and to select from catalogues rather than take the trouble of designing themselves.

All this is distinctly injurious to professional independence, and tending to weaken the architect's authority. If a client or committee can obtain a low tender for doing certain fittings or decoration, they are often tempted to supersede the architect, and it is the experience of all who have to do with building that a suggestion from an outside is more welcomed than the professional man's advice, even although the suggestion be from one who knows little of building or art. It is not the same deference to official authority that has been seen of late years in the carrying out of an unfinished design for public offices at Whitehall, left by the death of its architect, to the Office of Works, as the interior arrangement of a building designed by an accomplished architect could be left safely to the hands of officials? If a great piece of sculpture or a painting had been unfinished, such a proceeding would be laughed at; but the architect's work stands on another footing, and anyone appears to be thought competent to complete the design and details.

Of course, there are some cases where the architect may waive his right to insist; but it is necessary for him to draw the line between asserting his authority and accepting the opinions and recommendations of clients and tradesmen. Everything connected with plan, elevation, style, and details belongs to the essence of design ought to be strictly guarded as a professional right. The architect is engaged to show his ability in the



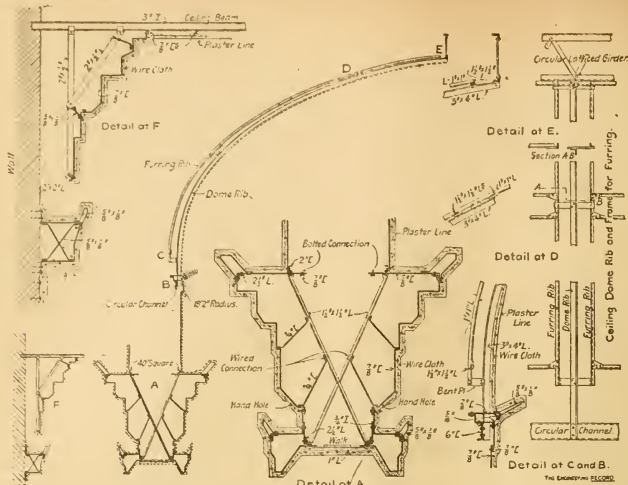
matters, and if he too easily surrenders his opinion he is giving himself and his profession away. Hence, unfortunately, through lack of judgment on his part, have to concede points in the arrangement or details of his building—for it is better to admit an error than to acknowledge defeat; but he should endeavour not to concede anything too hastily. Design in its various aspects is the stronghold of the position: it may be allowable, even tactical, to make modifications to suit a client's wishes, but the important point is to be able to defend with irrefragable argument any position or detail of plan that is assailed. It is not being able to do so when criticised, or rather indifference in defending his work, that endangers professional authority and gives occasion to the enemy. But in points immaterial, when they are not based on principles, but are more or less questions of mere personal taste, the professional man will do wisely to yield—perhaps under protest—to the views and recommendations of his client. We chiefly deplore that attitude of the profession which seems common nowadays, which makes no protest, that accepts anything that is offered—which acquiesces readily with the opinions and tastes of clients; allows him to dictate in plan and style, and in all contract questions; that looks complacently, because it saves trouble, on the client's concurrences with manufacturers and tradesmen and selection of stock designs, and which does not take the trouble to uphold the principles of his art against the attacks of the Philistine, the art heretic, and the so-called practical and commercial objector, such a lack of precision and definiteness in its work is fatal to the professional man who makes any claim to authority.

STABLING AND DEPOT FOR CAMBERWELL, GROVE VALE, EAST DULWICH.

WE publish herewith a plan of the new stabling attached to the Municipal Depot built by the Camberwell Borough Council at Grove Vale, East Dulwich, and formally opened on Monday last. The main depot buildings have been erected from the designs of Mr. William Oxtoby, Assoc.M.Inst.C.E., the borough engineer of Camberwell. The builder is Mr. H. L. Holloway, of Union Works, Church-street, Deptford, whose contract for the site work amounting to the sum of £28,195 was accepted by the last vestry. The clerk of works, Mr. H. Castle, has supervised the execution of the work on behalf of the late vestry of the borough council. The buildings are in five blocks, the first consisting of stabling,

veterinary surgeon's room, and copperhouse; the second of cart-sheds and stores; third of fodder stores and machinery; a fourth of workshops; the fifth comprising harness-maker's shop, two cottages, steam-roller house, coal store, and lavatories. Reverting to the first group, there are upon the ground floor two blocks of stabling, 91ft. 6in. by 32ft. each, and 12ft. high. Each block contains stalls for 19 horses, and four loose boxes, making a total accommodation on the ground floor of 46 horses. The size of the stalls is 10ft. by 7ft. each, and of the loose boxes 15ft. 4in. by 9ft. 6in. each, and the width of the stable gangway between the stalls is 12ft. The floor is laid with chamfered clinkers, while the walls are lined with blue Staffordshire brick dado 3ft. 9in. high, one course of red glazed bricks, and 2ft. 6in. with white glazed bricks, and finished with two courses of red glazed bricks. The brickwork above is lime-whited. The stalls are fitted with pitch-pine divisions, with open ironwork in the upper part thereof. The stall posts are of cast iron, and to each is attached an iron harness holder. The mangers are of cast iron. At the rear of each stall is an iron channel for drainage purposes. Above each manger a wrought-iron sash is fixed, which is made to open, and fitted with Adams's patent openers and fasteners. Above these sashes are fixed horse name plates, giving the number, date of purchase, name, and driver of each horse. The eight loose boxes are all 15ft. 4in. by 9ft. 6in., and each is provided with a separate doorway to the yard. The walls of the boxes are lined with blue Staffordshire brick dado, 3ft. 9in. high, finished with one course of red glazed bricks, and the upper part of the walls is of white glazed bricks. The manger fittings are similar to those of the stalls, and the same arrangements are made as regards light and ventilation. Between the two blocks is a stairway, 7ft. 6in. wide, leading to the first floor. The trends and risers are of cast iron, having a going of 18in., and a rise of 4in. high. The stairway is covered with a corrugated iron roof supported upon iron standards. Under the horse stairway is the veterinary's surgeon's room, 10ft. by 7ft. 8in., lined with white glazed bricks, and fitted with marble-top slab, lavatory, and tank bottle-racks, lockers, drawers and desk. A gun-store is also provided. Adjoining the veterinary room is a small store for stable utensils, 25ft. by 6ft., and just beyond the horse stairway is a manure-pit, 7ft. by 7ft., with a shoot from the first floor. The first floor also consists of two blocks, communicating by means of a bridge at the top of the horse stairway. Each of the first-floor blocks contains stalls for 25 horses, thus providing accommodation for 50 horses. These stalls are 10ft. by 7ft., and the floor and wall, partitions, windows, and fastenings are similar to those on the ground floor. Eight stalls at the southern end of each block are partitioned off, and each pair of these stalls is separated by swinging

divisions and movable stall posts, so that the pair can be converted into one loose box if required. By this provision a total of eight loose boxes can be arranged upon this floor. The whole of the stall and manger fittings have been furnished by Messrs. Musgrave and Co., of Belfast and London. In fitting up these stables, the health, safety, and comfort of the horses were the points to which particular attention was given. The stall divisions and loose-box inclosures are very strongly made, being practically unbreakable, and are of such a length as to prevent any horse kicking any of the horses in the adjoining stalls. The heads of the divisions are fitted with solid iron panels to prevent the horses annoying one another while feeding, and the remaining part of the divisions is fitted with open panels to allow of free ventilation through each range of stabling. In addition to the above, each division has a bracket fitted to the pillar to take the harness when the horses are put into their stalls for the night. Each manger is fitted with a large, strong, safety steel front, which reduces the risk of injury to the horse to a minimum. The feeding troughs are very large, and are fitted with rollers which keep the horse from throwing the food out of the trough, and thus prevent waste. The halter-tyings are noiseless, thus assuring comfort and repose to the horse, and are arranged in such a manner that when the animal is feeding or lying down there is practically no weight dragging at his head, the whole weight being taken off by means of an automatic stopper. A tap is provided at the end of each stable for drinking purposes, and a hydrant and hose are fixed above each tap to allow of the flushing of the whole of the stables. The roof over the stables is formed with iron principals, with V-jointed match-boarding laid diagonally, and covered with felt and slates. There are three lantern lights in each of the first-floor blocks, fitted with Hill's patent openers with long rods and cranks. The whole is lighted by back lanterns and convertible beacon lamps. The doors are fitted with the latest improvements in locks and fastenings. The first-floor stables have each a gangway 5ft. wide, one leading to the flat and the other to the corn store. This is just outside the south-eastern portion of the block, and is a small brick-built detached building 6ft. by 6ft. The copper is of a capacity of 30 gallons. In the second block the ground floor consists of two cart-sheds, one 100ft. by 46ft., and one 80ft. by 48ft., fitted with pitch-pine bumpers and also stand-posts and valves for flushing purposes. There is room for 80 carts and vans. The floor is paved with asphalt, and the walls lime-whited. A part of this floor, 50ft. by 18ft., is occupied by the corn store building, and is described hereafter. In the centre of the ground floor is a cartway 18ft. wide, leading to stables, and having granite guards on each side. The whole is lighted with nine incandescent lanterns, whilst natural light is obtained from an opening 20ft. by 20ft. left in the floor above. A portion of this floor, 20ft. by



SECOND CHURCH OF CHRIST, NEW YORK CITY.

It is occupied by a store for iron, where all the different kinds required are placed in 95 pigeon-holes. To enable vehicles and materials to be taken to the flat above, a two-ton hydraulic lift is provided, which was supplied by Messrs. May, Vandyke, & Co. The flat above is also provided with communication with the cart and store flat. On this flat a superficial space of 67ft. by 24ft. is occupied by the corn store building, which is here extended over the cartway before mentioned. The remainder of this flat is an open space of 1,200ft. super., paved with asphalt, and is used for the storage of coal.

In the flat is the open space 20ft. by 20ft. mentioned in the ground-floor section, introduced to provide natural light to the cartway below. The whole of this floor is strongly supported by columns and girders, and several additional columns are contained in the cartway for safety. A gangway 20ft. wide, on the south side communicates with the workshop. The fodder and corn store takes up a portion of the second black, and is a four-story building. Upon the ground floor the space occupied is 30ft. by 18ft., and upon the first, second, and third floors the extension is 20ft. by 18ft. The whole of the walls are lime-whited. The machinery has been provided and fixed throughout by Messrs. Phillips and Son, of Reading. Communication between the several floors is provided by means of a circular iron staircase, and a number of lifts for the coal and machinery rooms. The ground floor of this block has in the centre an elliptical archway, 20ft. wide, formed to provide a cartway for the horses and vehicles. The sides of the archway are protected on the floors by granite curb guides, and the walls are lined to a height of 4ft. 6in. with the standard brick. The arch is lined with bricks, including the arch, by brown glazed bricks. Upon the west side of the archway are four shops floored with granolithic. One of these shops is used for smiths' work, one for farriers', and two for wheelwrights', and each is 24ft. 9in. by 12ft. 6in. The other three shops are for the painter, and the same number in the farrier's shop. Only the minor repairs to the carts, together with the wheel work, will be carried on in these wheelwrights' shops, the main shop being on the first floor. The machinery in this shop has been supplied by Messrs. Thomas and Son, of Reading, Limited, of Reading. The (fourth) next smiths' shop are the furnace and making platform. Upon the east side of archway

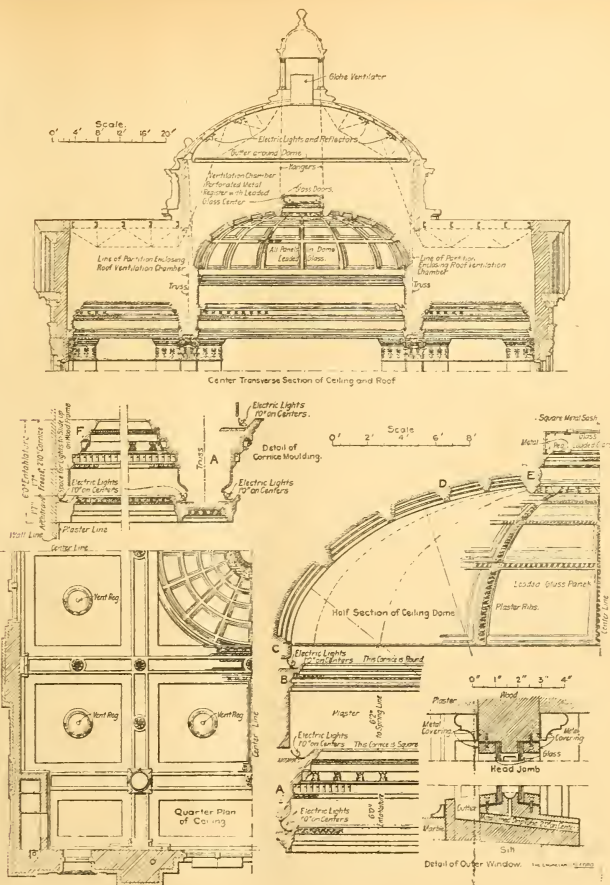
are the following rooms and shops, the whole of which are floored with granolithic—Gas-meter room 12ft. 10in. by 10ft., gas-engine room 21ft. 9in. by 10ft., cement store, and machinery shop 45ft. by 58ft. In the extent of the building has been supplied by Messrs. Thomas Robinson and Sons, Ltd., Rochdale. On the first floor, reached by a stone staircase, are carpenters' shop 45ft. by 23ft., wheelwrights' shop 45ft. by 23ft., and painters' shop 43ft. by 30ft.. The iron sashes in the walls, which are made to open and fitted with W. and R. Leggett's patent fasteners. The roof is formed of iron principals and timber rafters, and match-boarded. The front of this block is built of a fine Staffordshire brick, and is finished with glazed bricks above to first floor, beyond which brick brickwork is used, with blue Staffordshire buck arches. The whole of the shops are provided with incandescent lanterns and brackets, for use when artificial light is required. The rooms and shops have been executed in the shops, and new vehicles will be put in hand at an early date.

SECOND CHURCH OF CHRIST, SCIENTIST,
NEW YORK CITY.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

NYLS new building, erected opposite Central Park on Eighth-avenue at Sixty-third-street, New York, occupies an area about 100ft. by 127ft. in plan, and has extreme dimensions of 89ft. by 110ft. for the outside wall above grade, and a total height of 110ft. The base of the building is finished with a wall of granite with white concord granite. The remaining upper part of the four sides is faced with white South Dover marble. The exterior of the dome above the roof is entirely constructed of copper, and the roof is covered with black slate. The inside is furred with metal furring and wire lath. The interior walls and ceiling are finished with white plaster. The main trusses and roof are constructed with steel beams, which support the wire-lath construction and concrete. The roof is carried on steel trusses, supported at the exterior walls and by two steel columns constructed of plates and angles. The two main trusses and a king and eight dormer trusses support part of the roof. The main trusses support all cross trusses and trussed purlins. The partitions vary in thickness from 2in. thick when

blasted on both sides to 6 in., and are constructed with iron bars and wire lath. All ceilings are wire lath, and either secured to bottom of steel beams or hung independently by metal rods from the structural work. Some accommodations for hanging of pictures and bookshelves are made in brick or plaster, and the building is as completely fireproof as possible. With the exception of a few small windows of the exterior, which have wood frames and sashes, all large windows, which are glazed with art glass, have copper frames. The windows are made in brick or concrete steel beams and angles, with a limited amount of white pine bolted to the iron-work for securing the copper-work to. The casings and mouldings show the same design, both inside and outside. Where a large surface is glazed, on account of the difference in temperature outside and inside, water condenses on the inside of the glass and runs down on the window-sill. Therefore, the architect has made arrangements for collecting this water and carrying it outside by a continuous gutter on the inside of the copper casing, and from this, through a vertical window-sill, to the outside. The gutter runs on the outer casing, and the large windows are glazed double—that is, the art glass is on the inside of the window, the space of about 2 in., and the outside glazed with plate-glass. To allow for any further condensation in inside gutter is culled for, because the metal lath already spoken of. The details for the interior work consist of marble base and wainscoting marble door casings, and all stairs of marble. The window jambs are finished with plaster, and all window-sills and stools are of Tennessee marble, and hint of the used in the interior of the building. The floors in the reading-room and small offices are of quarter-oak, and all remaining floors of the building, including the auditorium, are of marble mosaic. In the front and side vestibule the marble floor is laid with different coloured marble tiles, the metalwork of which is cast-iron and electro-plated stannum; bronze, the back is of five-ply mahogany veneer, and the seat is upholstered in green velure. The basement extends under the whole building, and is accessible by stairways from the corners, and from the main entrance vestibule. In the centre of the main entrance vestibule. In the centre of the reading-room, about about 50 ft. by 5 ft. which is unobstructed except by the column



DETAILS OF DOMES AND CEILING.

SECOND CHURCH OF CHRIST, NEW YORK CITY.

supporting the auditorium floor, and has large area windows on one side. Small rooms are partitioned off at both ends, and on the south side there is a wide corridor off of which there are several office rooms lighted with area windows. An 8ft. by 26ft. library communicates with the reading-room by an archway on one side, and with the stair-hall or front corridor. In the corridor side it is fitted with sliding windows and counters for the sale of literature. At one end of the corridor there is a buffet for serving light lunches at the noon hour. At the opposite end there is a large office room, and under the sidewalk are the men's toilet and water rooms. At the opposite end of the building there are a number of store-rooms, a telephone room adjacent to the reading-room, and a number of office-rooms and two toilet-rooms. The two end corridors are intersected by a third corridor adjacent to the reading-room, on the opposite side of which, in one corner of the building, is the 17ft. by 42ft. boiler and machinery-room

and a number of office-rooms. The office-rooms vary slightly in size and arrangement, but average about 8ft. by 18ft., and have near the middle a partition with large double doors, and are lighted with windows to the corridor at one end, and to the area at the other end. On the first floor the entrance-vestibule is separated from the auditorium by a fireproof partition, faced with marble, and a similar partition at the opposite end of the auditorium encloses the 6th Street side entrance, the halls to the speaker's platform, organ-room, reception-room, office, and basement stairways. Over the front entrance vestibule there is a 17ft. by 70ft. gallery, and at the opposite end of the auditorium, at the same level, there are two office rooms and the choir. The auditorium is 80ft. by 70ft. on the floor, and 80ft. by 108ft. at the ceiling, is 55ft. high, and has a central dome 36ft. in diameter, which has a flat segmental curve with a 10ft. rise. This dome has a light steel framework of radial angle-iron ribs, sup-

ported from octagonal girders built into the walls and roof-trusses. It is glazed with amber-coloured cathedral glass of fish-scale design, and is panelled with deep plaster ribs. The roof dome, about 19ft. above the ceiling dome, is 42ft. in diameter and has 16 segmental steel ribs with 11ft. rise: it is panelled on the exterior with copper and glazed with alternate oval and rectangular windows of white hammered glass. The space between the two domes is inclosed by a 2in. plaster partition wall and the opening to same will have a pressed steel door. In the lantern surrounding the dome and in each of the four pinnacles there is a circular vent opening, closed by light horizontal steel doors operated by chains from the first story. The illumination of the auditorium is chiefly from the domes: sunlight enters freely through the art glass of the ceiling dome, and gives sufficient light in the daytime. Attached to the circular ribs of the roof dome are two rows of electric lamps, 12in. apart, with powerful reflectors arranged behind them to

throw as much of the light as possible through the ceiling domes. In order to prevent shadows being cast by the electric lamps and shades, and the glass, there is a cave left in the top of each, and in it, concealed from below, there is a continuous row of incandescent electric lamps, 12in. apart; similar rows of lamps are also concealed in the bottoms of all the other cornices and vertically below the bottom of the only visible lights in the auditorium are two large globe lamps on the platform and two lamps on the choir-rail. The ceiling-dome has sixteen radial ribs, each made of a single-curved 3in. by 1in. angle, attached at the top to a light drum, and extended vertically below the bottom of the dome to carry the steel furring for the cornice in the ceiling-panels there. The drum is a circular lattice girder, 10ft. in diameter and 15in. high. It is made with a single 3in. by 4in. angle for top and bottom flange, and 2in. by 1in. single intersection lattice-bars. The dome ribs support pairs of horizontal radial angles which form skeletons for the metal furring of the plaster ribs, and are connected as shown in the typical details. The furring is made of very light bent irons, covered in the usual way with stiffened wire cloth, and presents a smooth surface. The furring for the main dome cornice, for that in the panels of the roof trusses, and for the transverse false beams, is of interest on account of its unusual dimensions and some special features connected with the electric lamps arranged in it. The upper part of the dome-cornice is circular, and is supported from a 6in. channel rivet-rod to the bottoms of the dome-ribs. Concentric with this ring and about 5ft. below it there is a square framework made of a pair of horizontal channels, which are supported from the main roof trusses and dome girders. Between these there are light bent members in radial vertical planes which are the elements of the moulded and warped surfaces, and are covered with stiffened wire cloth to receive the plaster. The heating and ventilation system of the building is of special importance. The fresh air is brought in at the south arena through specially-constructed ducts, and this fresh air is drawn through the heating stack of about a mile and a half of pipe. The fan is located inside the boiler-room, and forces the air through the heating ducts which run under the entire basement-floor of the church, some of these ducts being 5ft. square. The warm air is taken from these ducts into various rooms and corridors, and let into these rooms about 8ft. from the floor.

THE CLAMOND GAS RADIATOR.

THE Clamond gas radiator promises to be an important development in gas-heating. It is based on the principle of the Kern burner, the high efficiency of which is, in the Clamond radiator, being directed towards producing heat instead of light.

The prominent feature of the Clamond radiator is that the heat it produces is "radiant" heat, by which the heat particles are projected into the room, heating only the solid bodies with which they come into contact. By this means the sphere of the room pure and fresh. The same effect, it may be mentioned, is produced by a coal fire, but the ordinary gas fire heats the whole atmosphere of the room, thus depriving the air of its freshness, and causing a feeling of oppression to those who have to sit for many hours under its influence.

As with the Kern burner, the Clamond radiator effects complete combustion of the gas, thus doing away with the unpleasant and sometimes injurious uncombusted products of combustion which too often escape into the room. The great advantage of a gas fire from all hygienic objections will be readily appreciated by householders, to whom all labour-saving contrivances are becoming every day more necessary.

The Kern burner gas radiator is unquestionably a distinct improvement in gas stoves. It is supplied in various designs, ranging from those that are simple and inexpensive to more ornamental and more costly types. But in all the types exhibited in a company's showrooms it may be said that a high standard of taste and excellence has been secured. To all interested in gas-heating, a visit to the Kern Burner Company's showrooms, Graveland, South-west-street, London, S.W., cannot fail to be instructive.

A new organ, costing £700, has been opened in, Throat in Wesleyan Church, Bradford.

OBITUARY.

MR. WILLIAM WATSON, architect, of Wakefield, whose death at the age of 60 we briefly recorded last week, was one of the first members of the Society of Architects, having been elected in 1857. He was twice elected a surveyor for Wakefield, and had an extensive practice. Two of his latest works are the new Board school at Louthouse-gate, recently opened, and the city workhouse infirmary.

MR. THOMAS LAWRENCE, of Blacknell, Berks, the senior partner in the well-known firm of Messrs. Thomas Lawrence and Sons, makers of millstones, died at his residence at Blacknell, Berks, on Tuesday, Oct. 22, at the age of 75 years. He was for some years a member of the Berks County Council, and when no retired, owing to ill-health, his son Arthur was elected as his successor.

MR. JACOB BIGGS, contractor, of Birmingham, died on Thursday week, after a sudden illness at his residence, 7, Greenfield-crescent, Edgbaston. Mr. Biggs, who was in his 30th year, had for many years been engaged in the construction of various public works, some of considerable magnitude. He had carried out sewerage works for the Birmingham Corporation, and had had the first section that lying between the Victoria-road and Hockley of the Birmingham cable tramway system, as well as doing a great deal of other work for the old Central Tramway Company. Mr. Biggs carried out several more or less important works in North Wales, including the sea outfall at Rhyl and the promenade at Colwyn. He was a Freemason, and a prominent officer of the Lodge of Israel.

The death took place on Tuesday, in Dumbarton, of Mr. WILLIAM BARLAS, builder, in his 70th year. Mr. Barlas entered the town council about ten years ago, and had all along been one of its most useful members. His practical knowledge was of great service, especially in the Roads and Bridges department. He served on the Magistracy for some years, and had been a Justice of the Peace for the county. He was married twice, and leaves a widow and family.

CHIPS.

The Manchester City Council have obtained the sanction of the Local Government Board to the borrowing of £40,000 for the purchase of land and the erection of baths in High-street, Chorlton-on-Medlock.

A large clock was started at Heeley church, Sheffield, by the Master Cutler on Saturday, Oct. 12. The clock strikes the hours and shows time on two dials, each 5ft. 6in. across, and has been made specially to the designs of Lord Grimthorpe by Messrs. John Smith and Sons, Midland Clock Works, Derby.

The Bishop of Winchester consecrated last week the church of St. Stephen's, Bournemouth, on the twentieth anniversary of the laying of the foundation-stone by Bishop Harold Browne. The church has been erected at a cost of nearly £30,000; to the memory of the first vicar of Bournemouth, the Rev. A. M. Bennett, whose son, the Rev. A. S. Bennett, is vicar. The church has recently been completed, and the debt extinguished.

A conference on the question of the housing of the working classes (town and country) is being organised by the Land Law Reform Association, and will be held at the Westminster Palace Hotel on December 3. Sir Walter Foster, M.P. (the President), will preside, and there will be two sittings of the conference. At the morning sitting rural housing will be dealt with, and in the afternoon town housing.

The formal opening took place last week of the new electric railway between Darwen and Huddersfield. The construction of the line has cost the Corporation £13,000. The railway is expected to have important results in the development of Darwen in opening out the great moorland districts of Pickup Bank and Huddersfield, as well as Waterside, been cut off from communication with the great towns.

The monument of Sir Simon Leach is in jeopardy. Sir Simon put it up at Cadeleigh, a remote Devonshire village, to commemorate his name, and the sum for its upkeep. But the family died out, and the dowry left 18th century lord to collect the money. It was invested in land. Now the tomb, with its life-sized figures and gorgeous canopy, the finest Jacobean monument in Devon, is tumbling into ruin, and Devonians in London are asked to aid in raising the insignificant sum of £50 for its support. Sir Simon Leach has no day in responding to this modest appeal.

Engineering Notes.

ARINXTON, MIDDLETHORPE.—After being closed for three years, the main railway from Newton-le-Phos to the second station was reopened for traffic, together with the new "Shank" bridge, yesterday (Thursday). The bridge has cost £9,000. The new Shank bridge affords direct road connection from the Edinburgh district with the south of Scotland. The old bridge, which spanned the valley of the Tyne, had some arches spanning the valley of the Tyne, had some signs of subsidence, and three years ago it was decided to rebuild it from plans by Mr. Davi, Rankine and Messrs. Crouch and Hogz, Glasgow. The contract for the erection of a steel girder bridge was let in May of last year to Messrs. Alexander Findlay and Co., Ltd., Motherwell.

It was found by the engineers that the massive piers of the old bridge could be repaired, and it was therefore decided only to take down the arches to the springing level, and to erect braced steel girders upon them for carrying the girders. These steel girders are about 20ft. high, and are formed of four rectangular columns braced together and bolted to granite-bearing stones built into the piers. A bearing girder is fixed on the top of each steel, on which the longitudinal girders rest. The superstructure consists of two longitudinal plate girders on the top of which the top floor is laid, and there is a lattice piling on each side. Cement concrete is laid in over this trussing, and the roadway is formed of tar macadam, with tar paving on the footway. The spans of the girders are about 47ft., and the width of the bridge is 28ft. below the parapets. The total length of the new bridge is about 320ft., and the roadway is 60ft. above the channel of the Gort Water. The sub-contract for the removal of the old bridge and the erection of the new masonry was placed with Mr. Stephen Hair, builder, Dalkeith, and the tar macadam and paving were done by Messrs. W. Walker and Sons, Leith and Ayr.

PETERHEAD HARBOUR WORKS.—The engineer's report on the progress of the harbour of refuge works at Peterhead, for the year ending March 31 last, has just been issued as a Parliamentary paper. It says:—During the past year the south breakwater, which was 1,200 ft. long, and the rubble mound was added to and partially levelled up over a length of about 800ft. ahead of the superstructure. This includes rubble deposited in foundation mound, 17,266 tons; concrete in blockwork, 19,921 cubic yards; and granite ashlar in forework, 28,047 cubic feet. The harbour harbour the retaining wall was extended 90 lineal feet (including the return end, unfinished. The new reservoir at Sterling Hill, which has a capacity of 750,000gal., was completed and brought into use in October last. The daily average number of men and horses employed on the works during the year was as follows:—Freemen, 132; convicts, 165; warders and guards, 28; horses, 1. The surveyor's report states that permanent work has been done to the breakwater, and material prepared for the year, which is valued at £23,780 17s. 6d. The cost per cubic yard of rubble is £17 9/10. The surveyor's valuation of the permanent work to the breakwater is more by £5,850 6s. 4d. than the cost set forth by the engineers; the value of the material on the ground at the 31st March 1900, was £13,789 10s. 11d.; the value of the material on the ground at the 31st March 1901 was £12,141 6s. 1d. The surveyors do not anticipate any excess on the revised 64 estimate.

RAILWAY WIDENING IN NORTH WALES.—Steady progress continues to be made by the London and North-Western Railway Company with the gigantic scheme for widening their line from Chester to Llandudno. During last summer the already commenced portion between Abergele and Bangor was found to be very useful, comprising as it does, one third of the whole railway between the points named. The Dee bridges are finished and there only remains the laying of the rails on them. In the course of a few months, the widening of the line will be completed at the Llandudno Junction, from Sandycroft to Connah's Quay, and from Flint to Bangor. Nothing has been done on the section from Abergele to Colwyn Bay, but preparations are in progress for erecting the new station at the latter town, and the doubling of the line from there to Colwyn will be carried out with the exception of a couple of viaducts, be a comparative

Building Intelligence.

ings matter. The goods yard, buildings, and sheds for Colwyn will be constructed during the present slack season, the passenger station being made next year. Beyond Colwyn Bay considerable activity is being displayed. Nearly all the and for the widening is now in the hands of the company. The length from Llandudno Junction to Mechnie will probably be ready by Easter.

CHIPS.

The spire and tower of Mithian parish church, Cornwall, are to be rebuilt, from plans by Mr. Edmund Sedding, of Plymouth.

At Watford, on Wednesday week, the new Alexandra Board School was opened in Judge-street, Watford. The building, which is 1,600 square in two departments, and has been erected at a total cost of £17,000. Mr. W. H. Syme, R.I.B.A., of Watford, was the architect, and Mr. A. M. Southern was the clerk of works.

Messrs. Mackenzie and Moncur, Ltd., Edinburgh have been appointed by His Majesty the Royal Warrant to build and erect a new building for His Majesty the King. They previously held a similar appointment to His Royal Highness the Prince of Wales.

The Dean and Chapter of St. Paul's have granted a lease for 99 years for a memorial tablet to the late Sir Walter Besant. The position selected near the tablet that commemorates Charles Reade, and Mr. George Frampton, A.R.A., has promised to undertake the work.

The Bishop of Coventry reopened on Friday the Pauline, Belsall Heath, which has recently undergone renovation. The organ has been removed and remodelled, and it will in future find a place in the gallery. The old gas standards are being replaced by hanging pendants, and the ceiling is being replaced by a ventilator. The organ constructed in the roof. The walls and ceiling are being decorated with symbolic devices, and his seating accommodation has also been improved. The renovation scheme includes a new altar and redds. Messrs. Buckland and Farmer, architects, are superintending the work of Messrs. F. J. Riley and A. Sears, the builders and decorators respectively, the cost of which exceeds £1,000.

The Bishop of Dover consecrated St. Luke's Church, Woodside, South Norwood, on Friday. In the morning the Bishop consecrated the altar and the nave was consecrated. In 1888 a church was added and the nave removed. Now the old nave has been demolished, and in its place stands a new building. The Bishop's church, which is of the same size it will be when the church is complete according to the design of Mr. W. D. Caroe. The present addition has freed the chancel of pews, and gives seating room for a congregation of 500.

The electrical equipment of the Union-street tramway system is now about to be completed. The system, which is now being completed, is accomplished none of the outlying districts is furnished with a speedier means of locomotion than horse traction. Reports by Mr. Dyack, borough surveyor, and Mr. Bell, electrical engineer, are being submitted to the Tramways Committee. Mr. Dyack shows how, with certain alterations and improvements, the existing lines in Castle-street, Union-street, and Holborn-street may be made suitable under the new system for other three years, at an estimated cost of £1,200. Mr. Bell estimates the cost of electrically equipping the track at the same wire system at upwards of £3,000, and the cost of carrying out conversion to the electric method at £1,000.

On Saturday afternoon Sir William Arrol, LL.D., (A.) laid the memorial-stone of the United Free Church which is being erected at Newlands, one of the rapidly rising suburbs in the south side of Glasgow. The church, which is built in the 15th-century style, from designs by Mr. J. B. Clifford, architect, provides accommodation for 800 people, and the total cost is estimated at £8,000.

The Kingsland School, Needles, erected at a cost of £12,000 (including furnishings), was formally opened on Friday by Henry Cecil, Esq. The school is designed with a large central hall, with classrooms entering from it, and with teachers' rooms. The total accommodation is for 724 scholars. The exterior elevations are treated in simple English Renaissance style. The school was designed by the late Mr. Robert Wilson, Edinburgh, completed under the supervision of Mr. J. A. Arncliffe, architect, Edinburgh.

The Infectious Diseases Hospital, which has been erected on the site for the Dundee and Forfar districts of the county, in proximity to the burgh of Forfar, during the past year or two, was formally opened on Friday. The buildings cover eight acres, and contain thirty patients. The total cost is £29,000. Mr. T. Martin Capper, of Dundee, the architect.

ASTON, BIRMINGHAM.—The opening of the large goods station which has been built at Avenue-road by the London and North-Western Railway Company, took place last week. The cost of the enterprise has been £100,000. Over 2,000 tons of steel were employed in the construction of the depot, and accommodation exists in the grain warehouses for 10,000 sacks. A suit of offices has been built in which rooms will be found for 80 clerks, and messrooms adjoining for the use of drivers and carmen. Altogether 200 workmen will be employed there. The new goods station affords double the accommodation at Curzon-street. Built upon foundations 500 tons of cement, the warehouse consists of four floors 25ft. long and 150ft. wide. The basement, which is concrete throughout, will be used for bonded stores and for cold storage, whilst the ground floor possesses every equipment for unloading goods. Sixteen sets of rails lead into the grain sheds, into which loading or unloading operations may be conducted by means of fifteen hydraulic and six hand cranes. Automatic lifts capable of holding tons of material communicate with the floors above, whilst outside the shed are two powerful cranes. Hops and general merchandise will be stored on the first floor, and grain on the second. The shed is also constructed to convey the sacks from the top to the bottom. The building is practically fireproof, the fact that the floors contain 7in. of solid timber being regarded as an important guarantee in this direction. Messrs. W. Pattinson and Sons, of Ruskington, Lincoln, were the contractors.

BATHGATE, LINLITHGOWSHIRE.—The foundation-stone of the new Masonic temple to be erected in Bathgate by Lodge Torphichen, Kilwinning, No. 13, was laid on Saturday with full Masonic honours. The present hall is being built on the site of the hall used by the Hopetoun Lodge, No. 181, now dormant. The new building is being constructed from plain stone, and is of the Renaissance style. The building is of two stories in height, having club premises and a caretaker's house on the ground flat and the hall or lodge-room on the upper flat, which is approached by a wide staircase, lighted by a window in the back wall, and consists of a hall 3ft. long by 21ft. wide, and a room 12ft. by 12ft. The hall is lighted by a row of five windows to Jarvie-street, the centre one being an oriel window projecting over the entrance doorway, and supported by the keystone of same. Externally these windows are separated by carved ionic columns, after the German Renaissance style. The entrance doorway is massive, with deeply moulded jambs and architrave, the latter broken by moulded rusticated voussours and keystone.

BIRMINGHAM.—The rebuilding of the Birmingham Temperance Hall, in Temple-street, has been carried out by Messrs. Even Harper and Brothers, the architects, and Mr. John Dallow, the builder. Outside and inside the stately edifice is of the Renaissance style. The main features of the facade are windows occupying the greater part of the height, with flanking square towers. Buff terra-cotta has been used for the windowed section, which, like the towers, projects slightly beyond the main wall. The towers and the main wall are of red pressed brick, with stone and other ornaments. Buff terra-cotta, the latter material being used also in the turret of each tower. The former central entrance, which formed a well into which the staircases and the floor approaches debouched, has been superseded by side lobbies under the towers. The stairs to the gallery on each side are of the same material as the walls. The main openings to the rear from galleries and floor, the hall, though its seating has been increased from 750 to 1,000, can be emptied in half the time it took to clear the old building. The staircases, fitted with granolithic steps and having a dado of glazed tiles in old gold and a wrought-iron handrail, lead to the first story. The gallery balconies sweep round in a horseshoe curve as in a theatre, and there is no division between the main and the side galleries. Hardwood lift-up seats are provided in the galleries for about 450 persons, whilst 550 loose chairs will be used on the floor. The gallery and chairs rise in tiers, but has its general level slightly tilted towards the platform. On the treads of the gallery steps cork carpet will be

laid, and the floors will be covered with linoleum. An ingenious feature is a collapsing partition, which will enable the portion of the floor under the main gallery to be formed into a separate room. The decorations of the interior include masks and other devices in fibrous plaster by De Jong and Co., while the chandeliers have designs in carton pierre. For the old semi-orchestral, oblong rostrum a plain platform has been substituted. The wall behind is slightly recessed in coved arches beneath an elliptical arch. A number of committee-rooms and retiring-rooms for performers are provided in the upper stories at the rear, while between the ceiling and the roof is a large store-room. The old roof has been retained, but with the exception of this and portions of the side walls left to support it during the reconstruction the building is practically new. Basements and sub-basements are provided in the administrative block at the back. The electric light has been installed by the Walsall Electrical Company, while brass brackets and pendants, in dull gold and of original design, have been provided by Mr. H. Bischoff. Renton and Gibbs radiators have been provided not only in the hall and rooms, but in all the lobbies and on the staircase. The sum of £6,000 has been spent in rebuilding and re-equipping. The most important improvement scheme which has been carried out in central Birmingham since the great Corporation-street scheme of the city authorities is that for the construction of the City and Midland Arches, which intersect the extensive block of business premises lying between Corporation-street, High-street, New-street, and Martineau-street. These new arches are now practically complete, and many of the 200 shops and offices provided are occupied, with the exception of the branch of the City Arcade, which is to provide a second outlet into New-street. A main approach to the City Arcade has been expended on the undertaking. The main arcade runs from High-street to near the junction of Union and Corporation-streets, and has two branches running off into New-street. The facades presented to the public streets are terra-cotta erections in the Renaissance style. The main arcade is inside the arcade is green, the balustrading which fronts the balconies and the pilasters of the shopfronts being highly ornamented on Moresque designs with green faience, shaded to imitate malachite. All the shops have basements, and a subway runs underneath the arcades to facilitate the disposal of goods. By means of the scheme a large area in the centre of the city, which has been almost derelict for business purposes, has been developed, and much space opened up in the principal shopping centre. The extension of the Grand Louvre has accompanied this work, as the City Arcade, for some time past, has been the main shopping centre, and now provides a number of additional shopfronts and entrances to that drapery house. The undertaking has been carried through by Mr. E. J. Charles, contractor, from designs by Messrs. Newton and Cheetham, architects.

BIRKENHEAD.—At a special meeting of the town council, to be held on Friday, the Health Committee will submit and recommend for adoption an improvement scheme under the Housing of the Working Classes Act, 1890. The property to be dealt with is in Albion-street, Wilbraham-terrace, Albert-terrace, Castle-buildings, and Albion-terrace; Oliver-street and Taylor's buildings; Warrington-street and Orderly Home, Orderly-terrace, Orderly Residence, and Orderly-place; Brook-street, Camden-street, and Ross-terrace; Marshall-street and Marshall-place. The number of houses now standing upon the lands proposed to be acquired is 150, consisting of 146 dwelling-houses, three houses and shops, and one lock-up. There are also 133 dwelling-houses and three houses and shops are inhabited. The number of the working class residing there and who will be displaced by the scheme is about 651. It is intended to provide dwelling accommodation for the displaced residents. The cost of lands, buildings, and works, is estimated at £10,275, and from this amount the sum of £3,164 15s. is deducted as the estimated value of land available for rebuilding or for sale, leaving £7,110 as the estimated net cost of carrying into effect the proposed scheme.

BOSSNESS, N.B.—Of late a large number of tenants have been dispossessed by Bossness Town Council, who are engaged in carrying out an extensive improvement scheme in the centre of the town. There has been a great dearth of workmen's dwellings, and many people employed in

the lurch have had to stay in adjoining towns and villages. Acting on the instructions of the town council, Mr. Lawrie, the lurch engineer, prepared a plan, showing a block of eight houses of two apartments each, for the wants of workmen. The estimated cost was £1,140, and the proposal was to erect them at the new street known as Stuart-avenue. It was calculated that the houses would yield a profit of 3 per cent. The town council approved of the plans, and agreed to invite offers from contractors. Should the final estimate not be over an appreciable extent that given by the lurch surveyor, the scheme will be gone on with. Plans have been passed by the Dean of Guild Court for the erection by Messrs. Hardie, builders, of a block of twenty-four workmen's houses at the junction of Stewart-avenue. The Kinross Company also contemplate erecting a large block of houses for their workmen to the rear of Dean-terrace, Be'nness.

CORNWAIN'S' HALL.—The hall of the Cornwain's' Company, situated on the north side of Cannon-street, has during the last few months had extensive decorative works executed to it. The internal decorations of the large hall on the first floor, and the lower hall and courtroom on the ground floor, were originally executed in the Adams style, but beyond simple friezes the walls and ceilings were left with plain surfaces. The Court have long felt that rooms of such good proportions required more decoration to complete them, and during the recent vacation they have had the lower hall and the courtroom ceilings decorated with Adams plasterwork, and have had a selected series of oval medallions fixed to the walls, thus breaking up their bareness underneath the enriched frieze which already existed. An Adams dado has been fixed in enriched material round the two rooms, and the whole of the rooms have been decorated throughout in a rich buff colour, relieved and picked out with gold. Both the new ceilings have also been gilded in their enriched portions, and care has been taken that the rooms shall be effective only in daylight, but in artificial light, under which they are largely used. The ceilings have been supplied and fixed by Messrs. Jackson and Sons, of Bathbone-place, the painting and gilding works being executed by Messrs. Hills and Sons, of Colman-street. The whole of the works were designed and have been carried out under the personal directions of Mr. Howard Chaffield Clarke, of Bishopsgate-street Within, the company's surveyor.

EDINBURGH.—The congregation that have hitherto met in the Wesleyan United Free Church in Wemyss-place have migrated to a new building erected at Cowdy Bank, which was dedicated on Saturday. Situated on the corner of East Fettes-avenue and Cowdy Bank-road, the new church building, which is built of red sandstone, and faced inside and without, occupies a commanding position. Erected from the design of Messrs. J. N. Scott and A. Lorne Campbell, architects, Edinburgh, the building comprises, in addition to the church proper, a hall seated for 500 persons, as well as sessions-house, vestry, ladies' room, kitchen, and cloak-room accommodation. The church was designed in the latter Gothic style, is cruciform in plan, and is seated for 700 persons. The main entrance gives access to a vestibule, from which the church is entered by three doors. The nave arcade is lofty, with piers and arches of stone, and clerestory over. Throughout the church are tracery and choir. The ceiling of the nave is supported by timber principals, the intervening spaces between which are finished in plaster, enriched by the introduction of interesting moulded ribs, with bosses at the intersections. A simpler treatment has been applied to the ceiling of the transepts and choir, where the rafters have been left exposed and finished plaster work formed in between. The pulpit, choir stalls, and Communion table and chair, all of which are executed in carved oak, are special donations. Another gift, in the form of an organ, is yet to be erected under the arch formed by the west wall. Unlike many new churches, St. Stephen's organ is completed in every respect, even in that of the painting and decorating, which have been carried out in a scheme of warm colours.

The new buildings of the Wesleyan Methodist Mission which have been erected in Earl Grey-street and West-Toll-roads, Edinburgh, were opened on Friday by Dr. Robertson Nicoll. Formerly, the site was occupied by shops and dwelling-houses. These were demolished, and in their place a block of buildings has been erected. The ground floor consists of shops, the rents from

which are expected to pay about half of the purchase price, amounting in all to £50,000. The principal entrance to the mission premises is from West Toll-roads, a side street. A wide staircase leads to a vestibule, the roof of which is supported by pillars, the floor of which is laid with mosaics. From this vestibule entrance is obtained to the principal hall—a hall capable of holding about 2,000 persons. The rostrum is at the north end of the building, and behind it is a semi-circular domed recess, which will be occupied by the choir, the floor of which will be laid with mosaics. The floor of the hall will be filled by a organ, for which space has been provided in the plans. Galleries run round the other three sides of the hall. It is lit by lofty windows at the sides, and is fitted up with electric light. In place of the ordinary pews tip-up seats are provided, and the underside of the seats is an arrangement by which felt hats may be affixed without any risk of being destroyed. Besides the large hall, there is a smaller one for lectures, and for use as a Sunday-school. There are about a dozen classrooms arranged on two floors, and a vestry for the minister. On the upper floor are the caretaker's house, and also a couple of rooms for the Sister. The architects are Messrs. Dunn and Findlay, Frederick-street, Edinburgh.

LANGHO, BLACKBURN.—A meeting of the Lancashire Incubriates' Acts Board has been held at Preston. Representatives from Manchester, Liverpool, Bolton, Blackburn, and other Lancashire boroughs were present. Tenders were discussed for the erection of the female division of the Incubriates' Home which it is proposed to build at Langho, near Blackburn, including the administrative block, laundry, boiler-house, engines, recreation hall, lodge, construction of road, electric lighting, &c. It was explained by the chairman that thirteen tenders had been received. These varied from £89,725, the highest, to that of Messrs. S. and J. Whitehead, of Blackpool, £71,249, the lowest. The Blackpool firm, however, had withdrawn, and the chairman asked the board to accept the recommendation of the works committee in favour of Messrs. Gerrard and Sons, of Swinton, for the sum of £73,418. The clerk pointed out that since the scheme was first mooted, three years ago, the cost of construction of buildings, owing to the increased price of material, had advanced considerably. Mr. Littler, county architect, said he had never given any estimate, although something was mentioned about the bids averaging from £300 to £400. Under the present tender, however, nearly £10,000 would be spent on building, which would serve for the male as well as the female patients. After further discussion the tender was unanimously agreed to, and the county architect was further authorised to engage a clerk of works at a weekly salary of four guineas. It was further decided to authorise the works committee to invite tenders for the erection of a male reformatory to accommodate 50 patients.

MANCHESTER.—Mr. Chancellor Smith presided at a Consistory-court for the diocese of Manchester held on Friday, when permission was granted for substituting a brass for a wooden altar-rail and for placing in the church a credence table at Kirkham parish church; a faculty was granted for a stained-glass window and a credence table at Penwortham parish church; the wardens of St. James's, Gorton, were empowered to replace a window in the north aisle with stained glass; permission was granted for similar memorials at All Saints', Heaton Norris, and at St. Mary's, Crumpsall; and for a brass tablet at St. Mark's, Collyer Quay. The vestments of St. Mary's, Heaton Roadish, and wardens applied for a faculty enabling them to erect a new wooden reredos, painted and gilded, and two niches containing figures of St. Mary and St. John; to provide a new oak pulpit; to supply a new altar cloth and oak choir stalls; to lay a black and white marble pavement inside the altar, and a new marble riser and tread to the altar steps; to provide new iron standards to the altar rails, and to provide oak rails. The faculty was granted.

NEWCASTLE-ON-TYNE.—The new Pavilion of Varieties about to be built in Westgate-road has been designed by Messrs. Wilson and Long, architects. The King William-street Strand will have a frontage to Westgate-road of 70 ft., and from the entrance-doors to the back wall of the stage is 170 ft. in depth. The pit and gallery entrances are at the extreme right and left of the

façade, the entrance to the stalls and grand circle being in the centre, three doorways opening into an entrance-hall, from which rise the staircases and corridors to the stalls and circle. A box-office occupies a central position in the entrance-hall. The auditorium will be divided into a ground floor, grand circle, and gallery. The grand circle has nine rows of tip-up seats, and on each side of the circle are three boxes. A grand staircase gives access from the stalls to the circle. The gallery has seven rows of seats, and in construction columns will be avoided. At the rear of the pit, grand circle, and gallery respectively will be refreshment saloons. The house will be constructed on fire-resisting principles, a fireproof curtain dividing the auditorium from the stage. The stage is 55 ft. high, has a depth from the curtain-line of 50 ft. The artists' dressing-rooms are in a separate block of buildings, shut off from the rest of the hall, with an iron door leading to the stage. These rooms will be warmed by hot water. The whole of the building will be lighted by electricity, with supplementary gaslights in corridors and on staircases. The proprietors will take immediate steps to clear the site and start the works.

ST. DAVID'S.—The restored Lady-chapel of St. David's Cathedral was dedicated on Tuesday by the Bishop of the diocese. The ceiling of the Lady-chapel collapsed 130 years ago. The work of restoration has occupied about a year, and has cost £2,500, and its accomplishment is due to the great efforts of the Bishop of the diocese, the chapter which had been roofless and in ruins since 1779, had to be practically reconstructed, and the ante-chapel has also been paved and repaired according to plans by Mr. John Oldrid Scott, F.S.A., who, in 1878 succeeded his father, the late Sir Gilbert Scott, as architect of the cathedral. The works are attributed to David Bishop Martin (1290-1328), the 59th bishop in direct line from St. David. At the morning service the Bishop of Exeter preached, and referred to the state of ruin which had befallen the cathedral fabric in consequence of the Cromwellian soldiers' looting from the cathedral, and the overthrow of the Church, which for many years delayed the restoration.

STALYBRIDGE.—The Astley-Cheetham Public Free Library which has been presented to the borough of Stalybridge by Mr. J. F. Astley-Cheetham, was formally opened on Friday. The library is adjacent to the new post-office, which has been designed in His Majesty's Office of Works. The style of the building is Jacobean, with great quantities of oak and bold cornice. The lower portion of the exterior is in stone, the upper part of both library and post-office being faced with bricks of a deep red colour. The roofs are covered with purplish red tiles. The outer doors and main entrance are of oak, and the interior of the work generally is pitch-pine. The central hall which is lighted from above, is surrounded by pillars and arches of red terracotta. The wheel of the western part of the building has collapsed, and is used as book stores or bookbinding work shops, and the eastern part is used as a store for staff, other than the chief librarian. The ground floor is nine steps above Trinity-street where is the main west entrance, from which a vestibule leads to the central hall. At the south-west of the hall is a reference library. At the north-west corner is a reading room. At the north end of the central hall is the boys' room. At the north-east corner of the building is the news-room, and at the south-east the bow store. At the south of the central hall are the librarian's private room and other necessary offices. The architect was Mr. E. H. Lister, of Manchester, and the builder Mr. Isaac Gend, of Leeds.

THE MONIE.—Among London's restaurants there is none more palatial than the Monie, which Piccadilly Circus and Shaftesbury-avenue are proud, which, since its establishment in 1877 has been repeatedly enlarged, and has been once again extended and redecorated. The building, from the decorative point of view, may now be regarded as an entirely new feature. The artistic modelling is without any thing of excess in plastic ornamentation: in the scheme of colouring, with the elegant upholstery, gives to the room a soft and agreeable effect. The walls have been fitted with moulded panels, highly decorated, and enriched with gold. The ceiling has been covered with fibrous plaster enrichments, executed by Mr. J. M. Beckinder, of Pratt-street, Camde-

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Our Illustrations.

ROYAL CALEDONIAN ASYLUM.

THE new schools of this institution are now being erected at Bushey, Herts. They are planned to board and teach at present 140 children—viz., 80 boys and 60 girls. The plan is so arranged that, when completed, 40 more boys and 20 more girls will be accommodated by the addition of dormitories only. For the sake of easy supervision, a simple plan with a long corridor has been adopted, with the dormitories at either end for boys and girls. Behind the hall a transverse block, one story high, with the kitchen and offices, and an open central space for a dining hall has been arranged. In the present the assembly hall will be used for dining. Behind this block, again, is the swimming-bath and laundry in a separate block, connected by a short corridor. The central dining-hall and additional dormitories will be added when funds are available, also covered play-rooms, where at present are shown temporary corridors to the lavatory blocks. The floors throughout are fireproof, and the corridors and staircases are of granolithic. The lighting is by electricity. The elevations are of red brick, with Monk's Park stone dressings. The architect is Mr. W. Emerson, F.R.I.B.A., The Sanctuary, Westminster, and the builders are Messrs. Kerridge and Shaw, of Cambridge.

GRAYTHWATT, HALE, BARNES, ALTHAMHAM.

THIS house, erected by Mr. F. B. Dunkerley, F.R.I.B.A., for his own occupation, stands on an elevated site, facing the south, and nearly all the principal rooms have at least one window with a southerly aspect. The kitchen, lavatories, baths, pantries, &c., are all concentrated at the north-east corner of the house, thus avoiding long lengths of water supply and pipes. The house is largely faced with grey rough-cast over a brick base, but half-timber work of oak, left rough from saw, and of substantial scantling, is introduced in some parts of the building. The roof is covered with Yorkshire flags. Oak panelling is largely used in the interior, and particular attention has been paid to the design of the metal work, lead glazing, and other details.

TECHNICAL SCHOOLS, SOUTHEND-ON-SEA.

THIS building, which forms part of a comprehensive scheme for placing the various municipal buildings on one site, is now in course of erection. The foundation-stone having been laid by Lord Arbery on September 24. Red brick facings with Portland stone, and red tile roofing are used in the erection. Mr. West, of Chelmsford, being the contractor. The whole of the construction is fireproof. Messrs. Henry T. Hare, F.R.I.B.A., and Thomas Davison, A.R.T.I.B.A., are the architects.

LAST week we gave a view of this building, and, as then promised, we now publish the two chief elevations and plan. Mr. Thomas Garner is the architect.

SECOND CHURCH OF CHRIST, SCIENTIST, NEW YORK CITY.

For description and detail drawings see p. 546.

THE "RED LION," MABLETHAM, NEAR WOODBRIDGE.

THIS old stucco-fronted Suffolk tavern was a posting-house in bygone times. It was added to in red brick subsequently in the vernacular style of the day, with outside shutters, as seen in the accompanying sketch. The house in the upper part of the older portion of the house is similar to the oriels of the Ancient House in the Butter Market at Ipswich. A feature is made of the carved sign of the Red Lion, which is treated as a sort of eaves-bracket. The house stands by the roadside on the main highway from Ipswich to Yarmouth, about two miles south of Woodbridge, and has a quaint old bar-parlour.

CHIPS.

THE extensive new factories erected at New Cross by the Mazawattee Company recently opened, have been erected under the direction of Messrs. Stott and Sons, of Manchester, and cover nearly 40 acres of ground. The buildings extend from north to south about 700ft., and from west to east about 300ft.

The county councils of Rutland and Leicester have decided to apply for sanction to an expenditure of £211,278 for the erection of the new asylum at Northburgh.

MR. W. A. Ducat, an inspector from the Local Government Board, has held an inquiry into the application of the corporation of Colne, Lancs, for sanction to borrow £20,462 for the paving, sewerage, and surface-water drainage of about 50 streets. The borough surveyor has received instructions to prepare a scheme for a new fire station.

A new board school at Yetholm, N.B., was formally opened last week. It has been built from plans by Mr. T. P. Marwick, of Edinburgh.

THE President of the Local Government Board opened, last week, the first of a series of new North-East Halls. During the last three years the Corporation have been clearing the city of numerous slum areas, and others which will shortly be demolished. Besides making new thoroughfares, a large square is to be provided, in which a monument to Queen Victoria will be erected. The work, when finished, will add about a million sterling to the indebtedness of the Corporation. Mr. Long named the first new thoroughfare King Edward-street, and the Mayors christened another Jameson-street, whilst Mr. Robert Jameson unveiled a statue of Sir William De la Pole, who was the first Mayor of Hull 600 years ago. At the subsequent dinner it was announced that the joint committee of the North-Eastern and Hull and Barnsley Railway had given instructions to the engineers to invite tenders for the construction of a 60-acre dock at Hull. The joint dock is estimated to cost about two millions.

THE site which the Brighton and South Coast Railway Company have decided to occupy for new works at Lancing, near Shoreham, is between 110 and 150 acres in extent, and would provide ample accommodation, if necessary, not only for the Brighton workshops, but also for those at Barmston and Grays Hall.

A new Wesleyan chapel has just been built at Cardingham, near Bodmin. Mr. W. J. Jenkins, of Bodmin, was the architect; and Messrs. Jory and Sons, Milpoll, and Mr. J. Bunt, the builders. The chapel is of granite, and seats 120 persons.

AT St. Paul's Church, Ballymore, a memorial pulpit of carved oak and a prayer desk of the same material in design were dedicated last week by the Lord Bishop of Cork. Both pulpit and prayer-desk were made by Messrs. Harry Hems and Sons, Exeter. The pulpit forms a hexagon. Each of five of the sides is composed of an open arch of three arches, with tracery in the English Decorated style, the arches standing on carved panels, each of a different design, the whole surrounded by a cornice of foliated design undercut and carved. The *Proceedings* correspond in design.

THE Thyl District Council selected, last week, a site on the centre of the sea-front for a new pavilion for the town. It was decided that premiums be offered for the best set of plans and designs. The Council were also anxious as to the site, which lies between Water-street and Edward Henry-street, and urgency was pleaded in order that the building shall be ready for next season's entertainments.

COMPETITIONS.

QUEEN VICTORIA MEMORIAL.—The plans and drawings of the five architects selected by the General Committee to compete for the Queen's Memorial, including the scheme by Mr. Aston Webb, A.R.A., finally chosen, together with a photograph of the sketch for the monument itself by Mr. Thomas Brock, R.A., will be exhibited by command of the King at St. James's Palace on and after November 1. Tickets of admission will be obtained at Lord Chamberlain's office in Colour-court. Admission from 10 to 4. The total sum contributed towards the memorial is slowly rising towards the quarter of a million sterling originally aimed at. The aggregate now stands at £136,800.

SOUTH SHIELDS.—The award in the South Shields Municipal Buildings was published last spring. We now hear that another competition is to be held, and the previous contest is described as a preliminary one. The competitors are the three promoted architects in the original competition and three others who have been selected by the town council.

The peal of three bells in Lynton church tower is about to be increased to six as a Queen Victoria memorial.

The statement of accounts in connection with the sea-wall at Troon, N.B., show that the total cost has been £11,280. Towards this expenditure the Duke of Portland has contributed £5,154, 16s. 4d., which is one-half of the total amount minus certain extras.

The Bishop of Oxford preached on Monday in the ancient church of Marlston, near Newbury, which has just been enlarged through the liberality of Mr. G. W. Palmer, M.P.

IT has been decided that the local memorial at Birkenhead to Queen Victoria shall take the form of a Queen Eleanor cross, on the model of those remaining at Waltham Abbey, Northampton, and Reddington. The proposed outlay is £1,500, towards which £550 has been subscribed, and the selected site is Hamilton-square Gardens.

New public baths are about to be built for the Bristol Corporation in Maze-street, Barton Hill, from plans by Mr. W. S. Skinner, of Bristol. The large swimming-bath, 100 ft. long, and the elevators are of red brick with Bangor slate roofing.

THE foundation-stone was laid last week of a new north transept in connection with the restoration and enlargement of Wellesbury parish church. The works will cost £1,700, and efforts will afterwards be made to enlarge the south transept to like proportions.

THE Rev. A. W. Woodruff writes from Walberswick Village, Suffolk:—Archaeologists and visitors to East Anglia will readily recall the ruined churches of Danwich, Walberswick, and Covehithe. Within the last few years the side of the tower of Danwich has fallen. Prints of 1876 show Walberswick Church with most of the south-east wall intact; the greater part is now in ruins. The larger and more interesting church of Blythburgh, adjoining Walberswick, at the present moment in peril. A portion of the roof shows signs of danger, and the beautiful south porch may collapse at any moment. It cannot be the nation's wish that the splendid monuments of the past should be allowed to disappear; and therefore as vicars of Blythburgh and Walberswick—parishes which must look out for help—I appeal for help in their preservation.

Park-road Welsh Congregational Church, Liverpool, was reopened for worship on Sunday week, after extensive alterations, additions, and redecorations. A notable improvement is the installation of the electric light. The ventilating apparatus has been improved, and an organ will shortly be placed in position. The total expenditure has been about £2,000.

THE Waterworks Committee of the Leeds City Council report that the 36in. main which is being constructed from Swinley to Ecup has now been completed for over eight miles of its total length of about twelve miles.

THE formal opening of the Blackley Free Library and Institute, which has been erected near to the entrance of the David Lewis Recreation Ground, adjoining Boggart Hole, Clough, Manchester, took place on the 10th inst. The David Lewis trustees have contributed £1,000 towards the cost of the building, the remaining portion having been met by the corporation of Manchester. The edifice, which was illustrated in the BUILDING NEWS for Nov. 23, 1900, has been erected from plans by Mr. John Gibbons, of Chapel-street, Manchester. Messrs. A. B. Bullivant and Sons, Moston-lane, Blackley, being the contractors. The reading-room and lending library are each 46ft. by 27ft., and at the rear of a public hall 60ft. by 32ft., and seated for 600 persons.



HOUSE AT COLWYN BAY.

THIS house is built of red pressed Rushon brick, with Yorkshire stone dressings, and tiled the roof. It is a substantial and comfortable house, is built so as to command extensive views of the famous Pwll-y-creochan woods to the south and views of the sea are obtained from the rooms on the east and west frontages. The architects are Messrs. Booth, Chadwick, and Pokker, of Manchester and Colwyn Bay.

The police-court buildings in Bridewell-street, Bristol, are about to be extended from plans by Mr. Henry Watkins, of that city, recently selected in competition.

The sick lent cover, in memory of the late Mr. Henry Franklin, which has recently been placed in the baptistry of the Church of the Ascension, Brompton-hill, S.W., is from the design of Mr. T. E. Fowler James, F.R.I.B.A., of 50, Lincoln's Inn-fields.

NEW HOUSE, BARROW-ON-SOAR.

THIS house is being built close to Barrow-on-Soar, Leicestershire—a village celebrated for its extensive limestone quarries. The site commands a fine view of the Charnwood Forest. The walls of the building are hollow, and faced with Woodville bricks up to the chamber-floor line, and above that granite rough-cast is used for the facing. The roads are tiled, and timber-work is painted black with white sashes. Messrs. Moss and Sons, Ltd., of Loughborough, are the contractors, and Mr. J. Woodhouse Simpson is the architect.

Mr. S. J. Waring, jun., of the firm of Waring and Sons, Oxford-street, has added a tower to Fools Cray church in commemoration of Queen Victoria.

Sanction has been received by the Liverpool Corporation from the Local Government Board to the borrowing, by the city council, of £22,000 for museum expenses.

CHIPS.

Yesterday (Thursday) 9½ acres of the grounds of Lambeth Palace were formally handed over to the charge of the County Council for the use and enjoyment of the people of London.

Lord Reay, chairman of the London School Board, formally opened on Friday night a new board school in Fulham, called the "Peterborough." The new school is in Chuncarty-road, Wandsworth Bridge-road, and will eventually provide room for 515 boys, 515 girls, and 515 infants.

Mr. Andrew Carnegie has intimated his readiness to give to Dundee £5,500 for each of four branch libraries, and £11,000 for a central library and reading-room if the city will furnish sites and levy a rate of 2d. in the pound for maintenance. The offer was accepted with thanks at a meeting of the Dundee Town Council on Wednesday.

Colonel W. Langton Coke has held an inquiry at Reading into the application of the town council for sanction to borrow £7,949 for purposes of street improvements.



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64, HOLBORN VIADUCT, LONDON, E.C.; and 110, BOTHWELL STREET, GLASGOW.

WATER SUPPLY AND SANITARY MATTERS.

WALLASEY.—Intimation was officially received in Liverpool on Saturday that the Local Government Board had sanctioned the scheme for supplying the district of Wallasey with water from Wyrnwy, by arrangement with the Liverpool Corporation. At the last meeting of the water committee of the Wallasey Urban District Council instructions were given to the engineer to proceed with the scheme so soon as the sanction was received. The work involved in the scheme includes the laying of a line of pipes from the Wyrnwy Aqueduct, Delamere, to Leasowe, another line laid by the Wallasey District Council conveying the water thence to the new reservoir at Gorse Hill, New Brighton. The Liverpool Corporation will thus lay about twenty-five miles of pipes, and the estimated cost of their work is £145,000. The Wallasey Council's line from Leasowe to the Gorse Hill Reservoir is estimated to cost £17,500, and the Gorse Hill Reservoir is put down at £27,225, while the council are also authorised to spend £33,500 for water-mains in new streets. The population of Wallasey consumes about 1,700,000 gallons daily, and to meet this demand the Liverpool Council, in addition to taking their wells at Liscard and Poulton to the utmost, have been obliged during the last six months to purchase about 400,000 gallons daily from the Horkley and West Kirby Water Company, Limited. Under the scheme now concluded with the Liverpool Corporation, Wallasey will take a minimum of 500,000 gallons a day, to be paid for thereunder or not, and in consequence it can take up to 1,000,000 gallons daily. While, after five years' notice, the Liverpool Corporation undertakes to provide a supply equal to the greatest delivery capacity of the mains—namely, over 2,000,000 gallons every day.

A chemical laboratory was opened at Truro College on Friday. The new building is of local stone with Bath stone dressings and is valued at £24ft. It gives accommodation for twenty-four students.

The town council of Stockton-on-Tees discussed on Friday, and have still for adjourned consideration, a recommendation by the special committee specially appointed to consider the housing question, that in new streets a greater width should be adopted, that a lady inspector should be appointed, and also a municipal lodging-house and 49 workmen's dwellings should be erected.

At a meeting of the South Shields Master Builders' Association held in the Victoria Hall, South Shields, on Friday, Mr. J. Moore, junr, was elected president, Mr. Chinnie vice-president, Mr. D. Lawes treasurer, and Mr. J. G. Robertson secretary. Five representatives were appointed to the Northern Federation, and a young working committee was elected for the year.

The new Liverpool Sanatorium for Consumption in Delamere Forest was opened by the Countess of Derby on Friday. The building consists at present of an administration block, two stories in height, and a convalescent block accommodating 32 patients. It is situated on the summit of Rough Hill, some 500ft. above sea level. Messrs. Willink and Thicknesse, of Liverpool, are the architects. The buildings are constructed of a wire-wire felting, which is said to be absolutely impervious to weather. The outlay has been £15,000.

There was little activity visible at the Mart last week, the property on offer being both light and of an unattractive character. The total returns for properties for the week were £15,000.

The Duchess of Buckingham on Saturday opened the new hospital in connection with the Altrincham Hospital. The new buildings have cost £3,400.

The new church of St. Peter's, Oldham, which has been erected on the site of the old church, which was demolished about two years ago, and dates from 1715, was consecrated on Friday by the Bishop of Manchester. The new church is built of Buncroft stone both without and within. Messrs. Wild, Collins, and Wild, of Oldham, were the architects, and Messrs. T. Bevington and Son, also of Oldham, were the builders.

In our notice of the New Constabulary Buildings, Warrington, in our issue of the 18th inst., we should have mentioned that all the ground floors have been laid with Messrs. Stephenson and Parkinson's patent asphalt block flooring.

At the Chiswick Town-hall, on November 28, Sir William Richmond, Bart., M.P., was elected Mayor. Hogarth, which has been presented by Mr. J. Passmore Edwards to Chiswick, in memory of the great artist's long residence there.

The Borough Council of Shorelitch propose to purchase a tract of land as a site for dwellings which they intend to erect under Part III. of the Housing Act. The London County Council have sanctioned a loan of £25,180 for the purpose.

One Office Table.

UNDER the heading of "Telepathy Extraordinary," the *Architect's Magazine* prints in parallel columns a portion of Mr. Walter Emden's presidential address to the Society of Architects in December, 1900, and a letter by one of the members in the August number of *Architecture* of New York, in which the desirability of statutory registration of architects is advocated in absolutely identical words, the only modification made by the American writer eight months later being the substitution of "Architectural College of New York" for "The Society of Architects." Such instances of thought transference are not unparalleled, and are certainly suggestive.

The number of candidates for the office of engineer to the London County Council, the salary of which is £2,000 a year, in succession to Sir A. R. Binnie, resigned, has now been reduced to three: Mr. Maurice Fitzmaurice, B.A.M., who was assistant engineer of the River Thames, and is now engaged on the great dam at Assouan under Sir John Aird and Sons; Mr. E. George Mawbey, the borough engineer of Leicester, and president of the Association of Municipal and County Engineers; and Mr. Charles Elvin, of the engineers' department of the Council. Mr. Elvin, who is the city surveyor of the Council, withdrew his candidature, having been offered a higher salary to remain. Mr. Fitzmaurice, it is stated, will be recommended by the General Purposes Committee for the position.

AFTER much correspondence, the London School Board have effected a transfer to the London County Council of the Board's liability for re-construction of the classes in connection with certain of the sites scheduled by the Board in the Sessions 1895-1899 inclusive. The School Board will pay to the County Council a sum of £10,359, on condition that the Council shall take over the Board's obligations for the rehousing of 1,030 persons of the working class (who have been, or are being, rehoused) in connection with the sites under the Act, and on the sites belonging to the Council in Preston-road and Gaselee-street, Poplar, subject to the consent of the Home Office being obtained to the transfer of these obligations, and their acceptance of these sites in lieu of those approved by them.

The Corporation of Manchester propose to promote, next session, a general power Bill, and their scheme has, with one important exception, that relating to the contemplated widening of Corporation-street, been endorsed by a statutory meeting of owners and ratepayers, held at the Town Hall. The principal feature of the Bill is that conferring on the Corporation further powers in connection with their electricity undertaking. The powers asked for are to construct a bridge, electric mains, wires, and pipes across the canal arm, which separates the Dickinson-street and Bloom-street electric generating stations; to acquire land for the purpose of connecting the Stuart-street electric generating station of the Corporation with Lancashire and Yorkshire Railway by means of a railway; and to lay electric mains from Stuart-street station across the Ashton Canal of the Great Central Railway Company. Various street improvements are also authorised by the Bill, and a poll of the ratepayers will be taken as to the expediency of these proposals. The Bill, the clause relating to the widening of Corporation-street, from Hanging Ditch to Cannon-street, at an estimated cost of £50,000.

The thirty-fifth annual convention of the American Institute of Architects was held from October 2d to 5th at the Pan-American Exhibition at Buffalo. The principal topics discussed were the desirability of a change in the present mode of the constitution of the Institute, and of the present buildings under the Tarsney Act, on which papers were read by Mr. J. H. Rankine and Mr. W. A. Boring, and the planning, designing, and management of exhibitions. It was resolved to petition Congress to create a national art commission, and also to appoint a permanent committee of competition, composed of three members, to give advice to those desiring information, and to induce reputable architects to refrain from entering improper competitions. A committee of five was also appointed to secure the formation of a national bureau of architecture under whose administrative charge should be placed the architectural work of all the departments of the National Government, the work to be executed under a law similar to the Tarsney Act, which should, however, be mandatory, and not optional.

A world's congress of architects is to be held in St. Louis, in 1904, in connection with the centennial celebration of the Louisiana Purchase. The following officers of the Institute were elected for the ensuing year: President, C. F. McManis, New York; first vice-president, Frank Miles Day, Philadelphia; second vice-president, Alfred Stone, Providence, R.I.; secretary and treasurer, Glenn Brown, Washington. The next meeting will be held in Washington, October, 1902.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY.—Auctioneers' Institute. Opening meeting at the Examination Hall, Victoria Embankment, W.C. Inaugural Address by the President, W. Bennett Rogers. 7.45 p.m.

FRIDAY.—Architectural Association. "Cambridge in Early and Medieval Times," by A. Wood, M.A., F.S.A. 7.30 p.m.

THE ARCHITECTURAL ASSOCIATION.

MEMBERSHIP. GENERAL MEETING. 7.30 p.m. N. 9, Conduit-street, W. at 7.30 p.m. Paper by Mr. ALEXANDER WOOD, M.A., on "Cambridge in Early and Medieval Times." R. F. G. MACLE 1 Hon. Sec.

CHIPS.

Methley Parish Church, which has been sufficiently restored to admit of its reopening to-day (Friday). The work has cost over £3,000, towards which there has been received £1,700. The exterior has yet to be restored, and a new vestry and organ chamber are required.

Additions and alterations have been made to Fletton Parish Church, to meet the wants of the increasing population, which has resulted from the extension of the brickworks. The north aisle has been widened, and other alterations made, under the superintendence of Mr. W. Doyne, architect, of Peterborough.

The Manchester City Council have accepted the tender of Messrs. W. T. Glover and Co. for the supply, delivery, and laying of a number of mains. The amount of cable to be supplied under the contract is 147 miles, to be used for lighting and tramway traction purposes. The cable, the greater part of which will be used for connecting the Stuart-street generating station with the sub-stations, is to be laid within six months of the tender being given. The amount of the contract is at least over £130,000.

The church of St. John, Heysham, near Lancaster, was consecrated on the 17th inst. by the Bishop of Manchester. It is Early English in design. The total cost was over £7,000, and seats are provided for 500 persons. Messrs. Austin and Paley, of Lancaster, were the architects.

The Board of Trade inspection of the converted lines of the Plymouth, Devonport, and Stonehouse Tramways Company was conducted by Major Pringle on Friday.

Mr. G. S. Knight, of London, has been appointed surveyor and sanitary inspector to the Tavistock Urban District Council at the salary of £100 a year.

Colonel Durnford, R.E., an inspector of the Local Government Board, attended at the Town-hall, St. Helens, Laues, on Friday, to hold an inquiry into an application by the St. Helens Corporation for sanction to the borrowing of £30,000 for the construction of a new covered water main at Brownedge, and £3,400 for public and private street improvements. The borough engineer, Mr. J. J. Luckland, submitted the plans for the new reservoir, which will hold ten million gallons.

The retirement is announced of Mr. Edmund Neel, C.E., from the office of the Public Works Department at the India Office. The Secretary of State for India has appointed Mr. Frederick C. Thompson as Mr. Neel's successor. The salary of the office is £1,200 a year.

The housing of the working classes committee of the Southampton Corporation have decided to recommend the council to adhere to the original plan for the development of the area to the north of Simnel-street, which provides for the erection of 70 cottages for the housing of 70 persons.

The London and South-Western Railway Company are about to make extensive structural alterations at Waterloo, on which they will expend no less a sum than £750,000. When this is finished, and the platforms are increased in length, the site covered by the present and new covered water main at Brownedge, and £3,400 for public and private street improvements. The borough engineer, Mr. J. J. Luckland, submitted the plans for the new reservoir, which will hold ten million gallons.

The Central Technical School for Liverpool in William Brown-street, Clayton-street, and Byrom-street, will be opened by the Duke of Devonshire to-morrow (Saturday). The building, with the adjacent museum, has been erected from plans by Mr. E. W. Moffat, selected in competition by Mr. Aston Webb, A.R.A., as assessor, and illustrated in our issue of August 14, 1893.

Trade News.

WAGES MOVEMENTS.

BARROW-IN-FURNESS.—A dispute has arisen among the joiners in connection with the rebuilding of the pier at Barrow, and the current close last summer, when H.M.S. *Empire* sustained serious damage. The contract is in the hands of Messrs. Gradwell and Co., who have been employing a large number of the workmen. The joiners claim that this is a class of work that belongs to them. Several meetings have taken place between the Master Builders' Association and the representatives of the men, but as no agreement has been arrived at, all the joiners have been employed by the Messrs. Gradwell have been called out.

WORKMEN'S COMPENSATION.—The Home Office on Saturday issued a return as to the proceedings taken during last year under the Workmen's Compensation Act of 1907, and the Employers' Liability Act of 1880. Neither of the Statutes contains any provision for the making of returns to show the working of the systems of compensation which they respectively established, and the only sources from which official statistics can be obtained are the returns as to cases which came before the County-courts, which are supplied by the Registrars, and the returns of other cases comparatively few in number—in which memoranda received by Judges or awards by private arbitrators under the Compensation Act are registered. While, therefore, the returns contain some information of interest, they leave untouched the great mass of cases which come to workmen. In the majority of cases compensation is settled by agreement or by informal arbitration. No memorandum is registered, and no official information is therefore obtainable. The total number of cases under the Workmen's Compensation Act dealt with in England and Wales in 1900 was 1,145, as compared with 999 in the previous year. The number of cases awarded increased from 828 to 1,045, while the number of cases in which it was necessary to appoint a special arbitrator fell from 98 to 29. The cases settled by acceptance of money paid into Court numbered 70. In addition to these, there were 407 cases which were either withdrawn or settled out of Court. Of the claims for compensation cases finally settled within the cognisance of the Courts, the decision in 867 cases was in favour of the applicant, and in 194 in favour of the respondent. The proportion of cases in which the applicant was successful, therefore, increased from 75 per cent. in 1880 to 81 per cent. in 1900. In 326 cases of injury a weekly sum, in 536 a weekly payment. Both figures showed an increase as compared with the previous year. In 248 cases compensation was awarded on account of death. The total amount so awarded was £40,042 18s. 11d., a slight increase over the total figure for the previous year, but the average award in each case fell from £173 1s. 7d. to £163 8s. 9d. The grants of compensation for injury averaged £39 8s. 11d. In 326 cases of injury a weekly sum was assigned, 300 being cases of total and 236 cases of partial incapacity. The average weekly allowance in the former was 11s. 6d., and in the latter 10s. 9d., as compared with 10s. 11d. and 9s. 2d. in 1899. The increase is probably due to the rise in the average rates of wages which occurred in 1900. Of the 1,532 cases, nearly one-tenth, or 151, came under the head of employers' liability under the provisions of the Workmen's Compensation Act on the number of cases brought under the Employers' Liability Act, 1880, the reduction, as compared with 1898, is only 25 per cent., while the reduction in the cases recovered is about 34 per cent. The average amount of solicitors' costs under the Employers' Liability Act was £21 1s., and under the Workmen's Compensation Act £9 17s. The number of cases under the Workmen's Compensation Act carried to the Court of Appeal in England was 90, or nearly 60 per cent. of the cases that came before the County-courts. This is an increase as compared with 1899 of 1 per cent. Of the appeals 21 were by workmen and 30 by employers. Of the former nine and of the latter 25 were successful. There were seven appeals to the House of Lords, in six of which the workman was the appellant, and in five of the six the appeal was successful.

We are glad to hear that Mr. Alfred Waterhouse, R.A., who still remains at his Berkshire residence, Yattendon Court, continues to make steady progress. A Local Government Board inquiry was held at Cardiff, on Tuesday, with reference to an application by the corporation for permission to borrow £250,000, for the purposes of electric lighting. There was no opposition.

Colonel Shanks, an inspector under the Local Government Board, has held an inquiry at Guildford into the application of the Guildford rural district council for sanction to borrow the sums of £7,000 for sewerage and sewage disposal at Stoke-near-Guildford, and of £2,500 for works of sewerage at St. Catherine's and Guildford.

To Manufacturers and Others.—A Literary Agent at nearly thirty years' experience, and under the constant supervision of the London and Lancashire offices, offers his assistance for the acquisition of the management of technical courses dealing with the instruction of engineers, draughtsmen, and machinists. The student's text catalogue in three books is published, and the same information, specially adapted for schools, and also of the form of the latest volume, contains general instructions, and the publication can save time, space, and cost. For particulars apply to the Literary Agent, Messrs. H. K. & Co., Ltd., 10, PATERNOSTER, Strand, W.C.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, English	£3 0 0	to £3 10 0
Rolled-Steel Joists, English	6 10 0	to 6 15 0
Rolled-Iron Girder Plates	6 15 0	to 8 10 0
Bar-Iron, good Steel	20 0 0	to 20 0 0
Do., Lowmoor, Flat, Round, or Square	5 15 0	to 5 17 6
Boiler Plates, Iron	10 0 0	to 10 0 0
Best Steels	12 0 0	to 12 0 0

Angles 10s., Ten 25s. per ton extra.
Builders' Hoop Iron, for bonding, &c., 65 lbs.
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.
Galvanised Corrugated Sheet Iron

	Per ton.	Per ton.
6ft. to 8ft. lang, inclusive	£11 5 0	to £11 12 6
Best ditto	11 15 0	to 12 0 0

	Per ton.	Per ton.
Cast-Iron Columns	£6 10 0	to £8 10 0
Cast-Iron Stanchions	6 10 0	to 8 10 0
Rolled-Steel Fencing Wire	6 10 0	to 6 15 0
Rolled-Steel Fencing Wire	6 10 0	to 6 15 0
Cast-Iron Sash Weights	8 0 0	to 8 5 0
Cut Clamp Nails, 3in. to 6in.	9 15 0	to 9 15 0
Cut Flat Bars	9 10 0	to 9 10 0

Wire Nails (Points de Paris) —
8 0 9 0 9 9 9 10 11 12 13 14 15 B.W.G.
8 0 9 0 9 9 9 10 11 12 13 14 15 B.W.G.

	Per ton.	Per ton.
Cast-Iron Socket Pipes	£5 15 0	to £6 0 0
4in. to 6in.	5 15 0	to 5 15 0
7in. to 24in. (all sizes)	5 0 0	to 5 5 0

[Canted with composition, 5s. 0d. per ton extra; turned and bored joints, 3s. 0d. per ton extra.]

	Per ton.	Per ton.
Pig Iron —		
Do., Llanthyll, Llanthyll	105s. to 128s. 6d.	
Hot Blast, ditto	65s. 0d. to 70s. 6d.	
Wrought-Iron Tubes and Fittings—Discount off Standard		
Lasts 10 lbs. —		
Do., Banglow	70 p.c.	
Water-Tubes	65	
Steam-Tubes	65	
Galvanised Gas-Tubes	50	
Galvanised Water-Tubes	50	
Galvanised Steam-Tubes	47 1/2	

	10wt. casks, 5wt. casks.	Per ton.	Per ton.
Zinc, English (London mill)	£21 15 0	to £22 15 0	
Do., Birmingham	25	to 25	
Sheet Lead, 3lb. per sq. ft. super.	12 6	to 12 6	
Pig Lead, in sheet, pigs	12 0	to 12 6	
Lead Shot, in 25lb. bags	15 0	to 15 0	
Copper Sheets, sheathing and rods	80 0	to 80 0	
Copper, British Cast and Ingot	71 0	to 71 10 0	
Do., English Ingots	117 0	to 117 0	
Spelter, Silesian	17 6	to 17 5 0	

TIMBER.

	per load	£10 0 0	to £17 0 0
Oak	3 17 6	to 4 15 0	
Quebec Pine, yellow	4 7 6	to 6 15 0	
" Oak	9 0	to 9 0	
" Elm	5 5 0	to 6 0 0	
" Birch	4 0 0	to 6 0 0	
" Ash	4 0 0	to 6 0 0	
" Fir	2 10 0	to 4 0 0	
Wainscot, St. Petersburg	2 0 0	to 3 10 0	
Larch, Baltic, P.F.	4 0 0	to 6 0 0	
St. Petersburg	4 0 0	to 6 0 0	
Greenheart	7 15 0	to 15 0 0	
Do., English Ingots	117 0	to 117 0	
Spelter, Silesian	17 6	to 17 5 0	

	per load	£10 0 0	to £17 0 0
Oak	3 17 6	to 4 15 0	
Quebec Pine, yellow	4 7 6	to 6 15 0	
" Oak	9 0	to 9 0	
" Elm	5 5 0	to 6 0 0	
" Birch	4 0 0	to 6 0 0	
" Ash	4 0 0	to 6 0 0	
" Fir	2 10 0	to 4 0 0	
Wainscot, St. Petersburg	2 0 0	to 3 10 0	
Larch, Baltic, P.F.	4 0 0	to 6 0 0	
St. Petersburg	4 0 0	to 6 0 0	
Greenheart	7 15 0	to 15 0 0	
Do., English Ingots	117 0	to 117 0	
Spelter, Silesian	17 6	to 17 5 0	

Staves, per standard M—

U.S. pine	£37 10 0	to £45 0 0
Maple, or pine	23 0 0	to 23 0 0
Maple, birch	23 0 0	to 23 0 0

STONE.

Darley Dale, in blocks	per foot cube	£2 2 1/2
Red Mansfield ditto	"	0 2 1/2
Hard York ditto	"	0 2 1/2
Portland ditto	per foot cube	0 2 1/2
Portland ditto	per foot cube	0 2 1/2
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Portland ditto	per foot cube	0 2 1/2
Portland ditto	per foot cube	0 2 1/2
Portland ditto	per foot cube	0 2 1/2

All F.O.B. London.

OILS.

Linseed	per ton	£21 15 0	to £22 15 0
Rapeseed, English pale	"	25 0 0	to 27 0 0
Do., brown	"	26 0 0	to 28 0 0
Cottonseed, refined	"	31 0 0	to 31 0 0
Olive, Spanish	"	38 0 0	to 40 0 0
Seal, pale	"	23 15 0	to 24 0 0
Do., Coshin	"	31 0 0	to 31 0 0
Do., Ceylon	"	28 10 0	to 27 0 0
Palm, Lagos	"	26 5 0	to 26 10 0
Lubricating U.S.	per gal.	0 7 0	to 0 8 0
Petroleum, refined	"	0 5 1/2	to 0 5 1/2
Do., Stockholm	per barrel	1 6 0	to 1 6 0
Do., Archaeng	"	0 19 6	to 1 0 0
Turpentine, American	per ton	37 0 0	to 37 5 0

The lowest tender for the proposed widening of Dacre Basin Bridge, Patley, is £2,660. The Patley Bridge Rural District Council, on Saturday, agreed to pay one-third, the North Riding County Council defraying the rest.

A beerhouse, known as the Wheelwrights' Arms, at Hythe, Southampton, has been demolished, and on its site a large hotel has been erected, which was formally opened last week. Mr. E. J. Kington was the builder.

New Wesleyan Sunday-schools at Spittlegate, Gratham, were opened last week. They occupy the corner of Inner-street, and accommodate, in central hall, lecture-rooms, and classrooms, 400 children, at a cost of £2,430.

Messrs. J. G. White and Co., of New York, are beginning the final construction of an electric tramway system for Kalgoolie, Western Australia. The line will be over eleven miles long, and power will be supplied by a local power company.

The work of constructing electric tramways in Great Yarmouth was commenced on Wednesday week. The scheme is comparatively a small one, dealing only with the central portions of the borough and the north end, and is estimated to cost £70,000. The supply of poles and overhead electric equipment has been entrusted to the British Insulation Wire Company, of Prescott, who will carry out this important section of the work for £6,391 3s. 8d., and the Telegraph Manufacturing Company will provide the cable for £3,134 10s. 9d. The storage battery and booster will be supplied by Messrs. Crompton, of Chelmsford, at £2,600, and Messrs. Asham Bros. and Wilson, of Sheffield, are to furnish the points and crossings. The work will be carried out for the Corporation by Mr. J. W. Cockrell, Mr. H. A. Eccleston acting as clerk of works.

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LIST OF COMPETITIONS OPEN.

Tadcaster—Sewage Works Scheme	£20	J. A. Bromet, R.D.C., Clerk, Tadcaster	Oct. 26
Camberwell, S.E.—Baths and Washhouses, Old Kent-road			
A. Saxton Snell, F.R.I.B.A., Assessor	150yds., 78gs., 50gs.		29
Addingham—Conservative and Unionist Club	£20	W. Thompson, Addingham	31
Stockport—Municipal Buildings		Robert Hyde, Town Clerk, Town Clerk's Office, Stockport	Nov. 4
Skelmanthorpe—Sewerage Scheme		Wilson Fisher, Clerk, Skelmanthorpe	5
London, N.W.—Hearts of Oak Society's New Offices, &c.			
Euston-road (net £15,000)	£100 merged, £75, £50		
Barnsley—Guardians' Offices, Pitt-street	£20	Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, Adelphi, W.C.	15
Bexford—Isolation Hospital	£20	C. J. Tys, Clerk, 17, Regent-street, Barnsley	23
Bexhill—Laying Out 12½ Acres of Land as Ornamental Grounds	£20	T. Sholto Douglas, Clerk, Town Hall, Bexhill	23
Burslem—Isolation Hospital	£100, £50	E. Ellis, Town Clerk, Burslem, Staffs	23
Liverpool Cathedral—Ecclesiastic style imperative—Drawings of Designs or Executed Work			Dec. 20
Hull—Art School (net £10,000) (Assessor, Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, W.C.)	£100 (merged), £60, £40	The Hon. Secretaries, Church House, South John-street, Liverpool, Jan. 1	
Glasgow—Dwellings for Poorer Classes, Alexandra Park	£100, £3, £25	E. Laverack, Town Clerk, Town Hall, Hull	31
Croydon—Board Schools (700 places) and Caretaker's House		Sir J. D. Marwick, Town Clerk, City Chambers, Glasgow	Feb. 1
Hamstead Wells—Laying Out Recreation Ground, &c.		Henry T. Rutherford, Clerk, Blyth, Northumberland	
Tuan—Drainage Scheme	£50	D. C. Davies, Clerk to Council, Hamstead Wells	
Northampton—Boarding-House and Playing Field (est. £5,000)		James Daly, Acting R.D.C., Clerk, Tuan, Ireland	
Billing—road	No first; 23gs.	J. Haviland, Clerk to Governors, 2, St. Giles-square, Northampton	
Chadderton—Stanley-road Schools		J. Whitehead, Clerk to School Board, Chadderton, Oldham	
Northampton—Laboratories, &c. (est. £4,000), Abington-sq.		J. Haviland, Clerk to Governors, 2, St. Giles-square, Northampton	

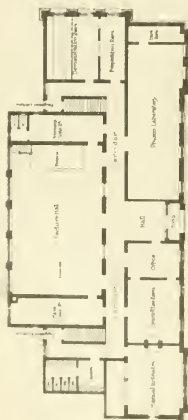
LIST OF TENDERS OPEN.

BUILDINGS.

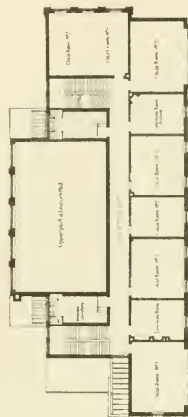
Minster—Alterations to Business Premises	Mitchell, Toms, and Co.	Arthur W. Yeomans, M.S.A., Architect, Chard, Somerset	Oct. 26
Barnstaple—House and Shop, Bear-street		W. C. Oliver, Architect, Barnstaple	26
Glasgow—Alterations to Infants' Room		Chas. E. Butcher, Architect, 3, Quaker-street, Colchester	26
Whitley—Branch Premises	North Shields Industrial Society	Hope and Maxwell, Architects, Seville-street, North Shields	26
Backfastleigh—Alterations to Roadway House	Corporation	Andrew Warren, Architect, Backfastleigh, Devon	26
Gowage—Jail, off Copthall Road		John Young, General Manager, St. Edmund-street, Devonport	26
Barnsley—Three Houses, St. Andrew's-road		W. G. and T. M. Architects, 10, Pitt-street, Barnsley	26
Chard Junction—Additions to Chapel Road Hotel	Mitchell, Toms, and Co.	Arthur W. Yeomans, M.S.A., Architect, Chard, Somerset	26
Torquay—School—Alterations to Infants' Room, Ralph Schools	G. H. Moon	Chas. E. Butcher, Architect, 3, Quaker-street, Colchester	26
East Keswick—Three Cottages	Broughton School Board	Carly Hall and Dalby, Architects, Prudential Buildings, Leeds	26
Brynter—Additions to Schools	Town Council	R. J. Kendrick, Clerk, 1, Henblas-street, Wrexham	26
London—Additions to Infectious Diseases Hospital		The Borough Surveyor, 30, Ker-street, Devonport	26
Asken-in-Furness—Primitive Methodist Sunday Schools		The Rev. W. Carr, St. Peter's Church, Dalton-in-Furness	26
Keighley—Pattern Stores, &c.	G. Wilkinson and Sons	W. H. and A. Sugden, Architects, Keighley	26
Woolwich—Post Office—Cottage	Gt. Northern Ireland Railway Co.	The Engineer-in-Chief, Armies-street, Terminus, Dublin	26
Exbury—Council Offices	Urban District Council	W. Handcock and Son, Architects, Branch-road, Batley	26
Parth—Vestry at Welsh Baptist Church	Building Club	Enos George, 15, Tauxhall-terrace, Port, Wales	26
Beckford—Women's Wards at Workhouse Infirmary	Guardians	T. W. Mallan, Architect, 4, Mount-street, Liverpool	26
Beckford—Hydraulic Power Building	Corporation Waterworks Committee	Greenhalgh and Brookbank, Archts., Bank Chambers, Southend-on-Sea	26
Bradford—Three Shops, North Parade	British Electric Traction Co., Ltd.	The Secretary, Waterworks Offices, Town Hall, Manchester	26
Northfield—Car-shed, Offices, &c.	School Board	The Chief Engineer, Donington House, Norfolk-street, W.C.	26
Chalford—Infants' School	Urban District Council	V. A. Lawson, Architect, 17, Rowett-st., Bradford	26
Preston—Alterations to Fulwood Workhouse Laundry	Gt. Northern Ireland Railway Co.	James Clarke, Clerk, Union Offices, Preston	26
Mains—Stationmaster's House	Hackney Institute Governors	The Engineer-in-Chief, Armies-street, Terminus, Dublin	26
Cowbridge—Farmhouse near Stalling Downs	Broughton School Board	Daniel Evans, Eastborne House, Cowbridge, Wales	26
Heckyrt, N.E.—Three Workshops, &c., at Cassland House	Urban District Council	R. J. Kendrick, Clerk, 1, Henblas-street, Wrexham	26
Exeter—New Schools	Urban District Council	T. Edgar Fellows, C.E., Surveyor, Town Hall, Willenhall, Staffs	26
Willenhall—Disinfecting Station	Furth Council	John Baxter, I.M., 249, St. Vincent-st., Liverpool	26
Glasgow—Frye Infirmary Hospital, Duke-street	Gt. Northern Ireland Railway Co.	The Engineer-in-Chief, Armies-street, Terminus, Dublin	26
Coltswain—Coal Store		John Lund, Borough Surveyor, Bedford	26
Belford—Washhouse at Smallpox Hospital	Brentford Union Guardians	H. H. Ward, Architect, Paradise-street, Birmingham	26
Widow's—Three Cottages, &c., at Cassland House	Guardians	T. Watkins, Clerk, Union Offices, Pontypool	26
Fentypool—Rebuilding Chimney Stacks at Workhouse	Tramways Committee	J. W. Cockbill, Borough Surveyor, Town Hall, Great Yarmouth	26
Great Yarmouth—Car-shed, Cister-road	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	26
Wretton—Kensington—Car-shed, Cister-road	Guardians	H. Goldsmith, Architect, 63, Faulstich-street, Manchester	26
Blackpool—Church of St. George, St. Hill	Urban District Council	A. J. Murgatroyd, Architect, 29, Strutt-street, Manchester	26
Blackpool—Hadded Rooms at Crumppall Workhouse	School Board	Walter Scott, Architects, 17, Colston-street, Gloucester	26
Bellbush—Town Hall	Corporation	L. Kenyon, Surveyor, 33, Chapel-street, Tottenham, Lancs	26
Tottington—Cartaker's House	Urban District Council	Colson, Farrow, and Nisbett, Architects, 43, Jewry-st., Winchester	26
Winchester—Museum on Site of Mechanics' Institute	School Board	The City Estates Surveyor, Town Hall, Oxford	26
Wodley—Extension to Infirmary Road School	Trevelyan Church Council	Trevor Williams, Architect, Victoria-road, Pontypool	26
Alford—Alterations to Market House	Wandsworth & Clapham Guardians	Lansell and Harrison, Architects, 65 and 66, Basinghall-st., E.C.	26
Pontypool—Iron Schoolroom	Colliery Co., Ltd.	The Clerk of Works, County Asylum, Lancaster	26
Walsworth, S.W.—Intermediate School, Seafield-road	H.M. Commissioners of Works	Garnde and Pennington, Architects, Ropetage, Pontfrem	26
Lancaster—Pathological Hospital at Lunatic Asylum	Co-op. and Agricultural Dairy Socy.	W. Cowan, Architect, Grimsdale-street, Barley	26
South Kirby, Wakefield—Shops, &c.	School Board	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	26
Adlington—Five Labour Cottages	Urban District Council	J. C. Bennett, Kilnham, Co. Limerick	26
Breckley, S.E.—Sorting Office for Postmen	Swindon & District Hospital Board	James Stephens, Clerk, 3, Green-street, Cardigan	26
Blackburn—Central Crematorium	Trinity House Corporation	R. B. Thorne Goole, Architect, Stanforth	26
Cardigan—Laboratory	Lancashire and Yorkshire Ry. Co.	M. R. Young, Clerk, Town Hall, Larn, Ireland	26
Stainforth—Classroom	Widow's and District Hospital Board	W. G. and T. M. Architects, 10, Pitt-street, Barnsley	26
Larne—Mortuary Chapels, &c.	Mallow Rural District Council	Sutherland and Jamieson, Architects, Elgin	26
Widow's—Chapel (200 ft. high)	St. Giles (Camberwell) Guardians	R. F. Wilson, Engineer, 10, Victoria-street, Westminster	26
Elm-Villa, Forth-avenue	Chiswick Urban District Council	Willink and Telford, 14, Castle-street, Cardiff	26
Alton—Electric Power Station	Woolwich Union Guardians	Chas. A. Kent, Secretary, Trinity House, E.C.	26
London—Isolation Hospital	Mallow Rural District Council	H. Sheldemire, Architect, Hunt's Bank, Manchester	26
Appleton—Alterations at Buoy Store	St. Giles (Camberwell) Guardians	Pell, Watson, and Meredith, 3, Salter's Hall-st., Cannon-st., E.C.	26
Hull—Hospital (22 beds)	Chiswick Urban District Council	M. Rezan, Clerk, Mallow	26
Surrey and Kileham—Repairs to Cottages	Woolwich Union Guardians	A. E. Mullins, Architect, 26, Church-street, Camberwell, S.E.	26
Peckham Rye, S.E.—Rebuilding House, &c., on Newlands	Mallow Rural District Council	Sampson Hill, Architect, Pleasant Villa, Mount Pleasant, Cambridge	26
Portsmouth—Rebuilding Wesleyan Chapel	Widow's and District Hospital Board	F. W. Lacey, M.I.C.E., Broad' Eng., Municipal Offices, Bourne-mouth	26
Bristol—Isolation Hospital, Claypans-lane	Chiswick Urban District Council	R. Ball, Architect, Grimsdale-street, Barley	26
London—Repairs to Cottages	Woolwich Union Guardians	H. Shaw, A.M.I.C.E., Surveyor, 7, Cranbrook-road, Hford	26
Sharnston—Repairs to Cottages	Mallow Rural District Council	The Secretary, Co-operative Society, Ltd., Cleator Moor	26
Hunstanton—Terrace of Houses	Deal and Walmer Joint Water Board	T. and C. Hawley, C.E.s., 30, Great George-street, Swansea	26
London—Car-shed, &c.	Water Committee	P. Robinson, Architect, 72, Albion-street, W.C.	26
Nelson, Lancs—Whitefield Schools	Lunguey School Board	W. Watkin Williams, Architect, 63, Wind-street, Swasey	26
Ilford—Tramway Car Sheds, &c.	Lunguey School Board	W. H. Johns, Architect, Vronessville, Llanfollan	26
Widow's—New Public Offices	Presbyterian General Assembly Com.	W. Watkin Williams, Architect, 63, Wind-street, Swasey	26
Cleator Moor—Butcher's Shop		W. H. Johns, Architect, Vronessville, Llanfollan	26
Deal—Engine House, &c.		W. Watkin Williams, Architect, 63, Wind-street, Swasey	26
Deal—Engine House, &c.		W. H. Johns, Architect, Vronessville, Llanfollan	26
Peatland—Nymysmire Infant School (250 places)		W. Watkin Williams, Architect, 63, Wind-street, Swasey	26
Newbridge—House, &c.		W. H. Johns, Architect, Vronessville, Llanfollan	26
Adlington—New School (180 places)		W. Watkin Williams, Architect, 63, Wind-street, Swasey	26
Salisbury—Assembly Buildings		W. H. Johns, Architect, Vronessville, Llanfollan	26
Salisbury—Rebuilding 90, Butet-street		W. Watkin Williams, Architect, 63, Wind-street, Swasey	26
Barnsley—Barnsley Town, Market Hill		W. H. Johns, Architect, Vronessville, Llanfollan	26
Salisbury—Enlarging Malthouse and Store		W. Watkin Williams, Architect, 63, Wind-street, Swasey	26
Merthyr Tydfil—Catholic Church		W. H. Johns, Architect, Vronessville, Llanfollan	26
Northham—Extension of High Pavement School		W. Watkin Williams, Architect, 63, Wind-street, Swasey	26
Salisbury—Additions to Corp's Quarters		W. H. Johns, Architect, Vronessville, Llanfollan	26
Hull—Kendall		W. Watkin Williams, Architect, 63, Wind-street, Swasey	26
Ordnance—Cottages at Sewage-Disposal Works		W. H. Johns, Architect, Vronessville, Llanfollan	26
Regley—Schools, Five Lanes End		W. Watkin Williams, Architect, 63, Wind-street, Swasey	26
Salisbury—Light Houses		W. H. Johns, Architect, Vronessville, Llanfollan	26



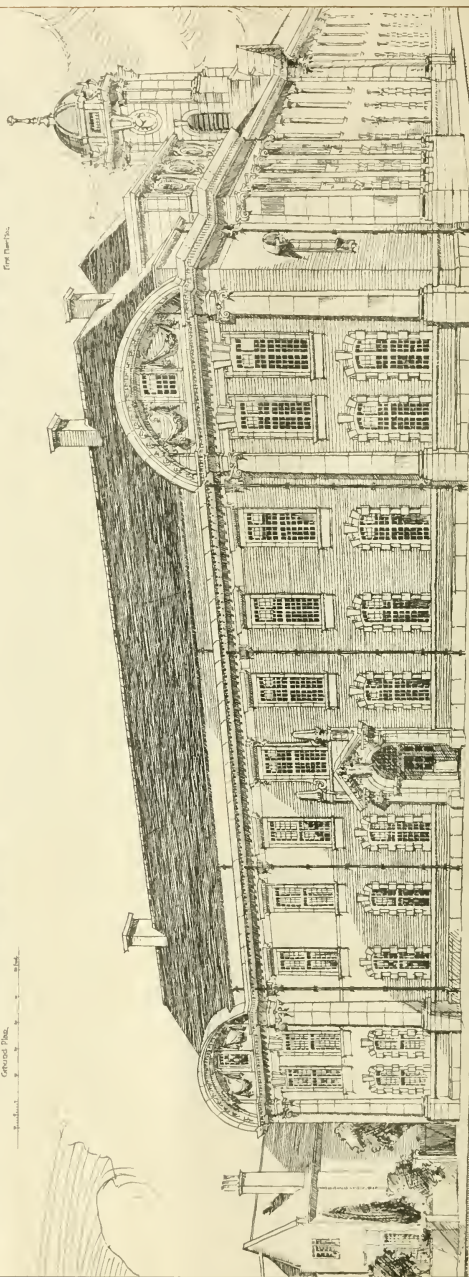
THE BUILDING NEWS, OCT^R 25, 1901.

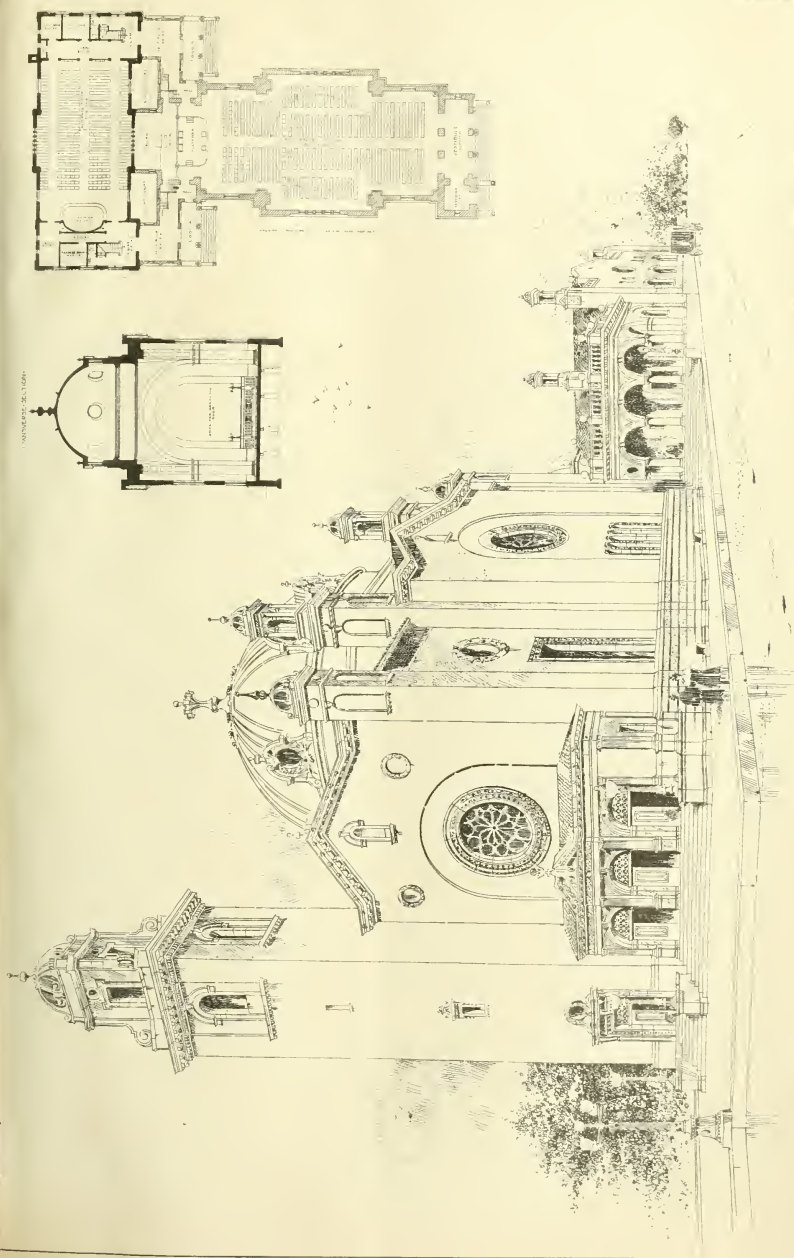


GROUND FLOOR.



FIRST FLOOR.





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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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BUILDING INSTALLATIONS.

THE installation of the city office block, or of any large public building, implies a vast amount of mechanical and scientific fittings and apparatus in the interior equipment of our modern structures that belong rather to the engineer and specialist than to the architect. And yet no building of the sort would be complete without them. They are a part and parcel of the structure, and have to be provided for in the architect's design. In not a few buildings this mechanical equipment becomes the essential part of the structure, to which the architecture is subordinate—as, for instance, in theatres, or baths and washhouses; but we now draw attention to the subject as it concerns the city office block, which has to present an exterior worthy of its position and purpose. In the United States the mechanical installation of the office building becomes a field for the best employment of the energies of the engineer; and in our country this engineering equipment is also beginning to be important in the architect's special skill. The relation of the engineer to be a architect in the earlier stages of the work may be of the most cordial and satisfactory kind—the engineer or mechanical expert in lifts or elevators, for instance, is taken into the architect's confidence, and after he has heard the proposal of the latter, the hydraulic or mechanical expert is prepared to make plans and estimates for the work, which may be incorporated in the plans and actions for contract. Everything goes smoothly till a question arises about the design of the cage or protection of the well-hole in an inclosure that will be in accord with the architectural fittings and decoration of the building. The engineering man regard only the bare conditions of their contract as the load to be raised and the height of travel, size of cage, and water-pressure on main. The architect, on the other hand, expects to see his design conformed to in detail, and is ready to find fault with anything that is contrary to his expectations. Friction of this kind is often inimical to any agreement between the two classes of work. Construction distinct from the architect's design is not so common in this country as in America, where the specialist is more in evidence; it is here rather more mixed up with the architectural design, and therefore is less open to the conflicting conditions which distinguish the buildings in the States.

We now consider the more important matters in the equipment of modern city buildings, and chiefly those mechanical installations necessary to render a building perfect. Fire protection is a matter of urgent necessity in a large city building, whether it is an office block or a warehouse. Of course, its construction should be made as nearly fire-resistant as possible, by the employment of fire-resistant materials and methods of flooring and construction. We now venture the remark that a structure that is provided with the best methods of floor and wall construction is always the safest, but the one in which the construction, lifts, and staircases are made where due precautions are taken to reduce the risks of a fire, and the use of fireproof materials, together with that stocked with non-combustible material in the building, is the safest unless the supplies

of air can be shut off at a moment's notice. The presence of a large mass of combustible goods, especially those that are loosely stacked, will render a fireproof building useless to restrain the flames when once a considerable part of the area is involved. The calamitous and destructive fire in Philadelphia lately reported is an instance. It is therefore necessary to supplement the construction by the provision of appliances of a fire-extinguishing kind, and such an installation is of the first importance. A fire should be extinguished before it makes any headway. Every floor of an office block or warehouse should have portable chemical fire-extinguishers, with sufficient length of fire-hose to reach to the extreme ends of the building, and, of course, this provision presupposes an adequate supply of water under pressure, and means of electric communication with the engine-room. How many of our city blocks of offices and large warehouses are so provided? In the office buildings of New York, Chicago, and other cities, fire-mans are provided, supplied with water from tanks on the roof, controlled by valves, and a fire-pump in the engine-room, in addition to connections on the outside.

Installations of heating and ventilation are also very systematically provided for in the American office buildings, and we may refer to a paper by Mr. Charles G. Darraach, M.Am.Soc.C.E., on "Mechanical Installation of the Modern Office Building," in which the subject is dealt with at some length. The conditions of the English climate are, of course, not the same, and steam heating is rarely employed in our London blocks of offices; but we may learn something from the remarks on the absolute power of high wind, and the loss of heat through window-frames and sashes, which apply equally to our buildings. In America 70° Fahr. is the standard temperature maintained within the building in New York and Philadelphia from September 1st to May 15th, where the average temperature is often as low as 30°, and sometimes falls below zero. To maintain a temperature of 70°, a powerful heating plant is therefore required. The author says: "Practice indicates the installation of from 140 to 200 H.P. for maximum use per 1,000,000 cubic feet, with one additional boiler unit in reserve."

The writer refers to the effect of high wind in reducing the temperature by abstracting the heat from the building. He says: "It is more difficult to heat a building during high wind with moderately low temperature than during a calm day and minimum temperature. Leakage through window-frames and sashes causes the greatest loss. During a high wind, a film of warm air on the outside of the building is blown off, and the radiation from the exposed surface is thereby increased. Tight window-frames and good weather strips prevent most of the loss from leakage. The loss in radiation due to wind must be made up by either higher steam temperatures in the radiators, or by additional radiator-surface." In both ways a high wind lowers the internal temperature of buildings, and, of course, if they are exposed on all sides, as a high structure would be, the effect of radiation of heat would be greater, and the cooling process more rapid. Mr. Darraach made some observations on the effect of wind storms. The rooms on the windward side of a tall building, when the temperature was only 17° and wind at 25 miles per hour, could not be heated to over 62° with steam in the radiators at 218°. Next day the room was heated to 71° with steam at 215°, although the external temperature had fallen to 9°; but the wind had fallen to 12 miles per hour. After the windows were weather-stripped, the rooms could be heated to over 70° with steam at 210° during gales of 35 miles per hour, and with a temperature of 15°. These results show the advantage of preventing leakage by weather stripping.

The saving in coal by this protection is from 25 to 30 per cent, with a temperature of about 30°. A table is given showing the results of two buildings both heated by direct radiation above the first story, the first story and basement heated with warm air, and ventilated with exhaust fans. One building was weather-stripped, the other not. The latter shows 25 per cent. greater coal consumption than the building unprotected; but there was a larger glass surface in the latter, and the height was rather more. The difference is accounted by leakage of warm air through windows, and engine-room losses. The author of the paper also refers to the practice of heating adopted in these buildings—namely, to warm the offices on the first story and basement by a plenum warm-air system, while the offices and halls above are warmed by radiators under the windows. One of the difficulties of artificial ventilation, the result of crowded buildings, is that the flues have to be located on the exterior walls and under the ceilings, so that the flues do not encroach on the floor space, and allow of alteration of partition, if necessary. Thus we find the wall spaces or piers between windows generally occupied by the flues; and where this is the plan adopted, it is a good plan to place direct radiators under the windows to supply the loss of heat due to wall and window exposure. Warm air can be supplied from the corridors to the offices through the transoms. The air of the external wall flues is exhausted by fans in the attics. The corridors are warmed by "direct-indirect radiators" under windows, or from basement. The separate offices are warmed by fresh warmed air, heated by direct-indirect radiators, the air being conveyed through a duct to each radiator from an opening under the window sill, the exhaust fans carrying away the vitiated air. The air can be supplied to the base casting of the radiator, either from the outside or inside of room, or from both, a damper regulating the admission. The outer air during the night can be cut-off and the steam saved. The author says the plenum hot-air supply, with the registers controlled by thermostats, is found expensive and difficult to control, and the supply of air depends on the temperature of the room, and not upon the ventilation requirements. Mr. Darraach says: "An equal distribution of steam at low pressure through small pipes can be accomplished by supplying the risers from both basement and attic. The writer has installed this system combined with the 'Webster vacuum system' in a twelve-story building, on which each of the steam-supply risers was only 1 1/2 in. in diameter, and served 600 sq. ft. of radiation." It is stated the maximum difference of temperature between the initial steam in the boiler-room and the farthest radiator did not exceed 3° when the outside temperature was 7°; the pipe sizes were one-half the areas used in vacuum systems. The method of distribution is said to be capable of application to a 24-story building, using 2 in. steam risers and serving about 1,200 sq. ft. of radiating surface. In the one-pipe system a single riser is used both to supply and drain the radiators, the risers being supplied at the top and drain at the bottom. Steam-heating installations are now being introduced into more buildings, especially those where a steam-boiler is used, where the pipes can be taken direct or from the exhaust steam of an engine. But the subject is not thoroughly understood by the architect. The pipes should be well insulated and arranged, and provision made for allowing the condensed water to escape at certain points. The low-pressure hot-water system is still the mode of heating largely employed for buildings of small size; but when high temperatures are required the steam installation is more desirable. As steam quickly condenses when the fire is damped, it follows the radiators soon cool; but in the low-pressure hot-water heating

system, the heat can be sustained for considerable time.

Another installation of importance is that of the electric light, but one which the architect, for certain reasons, has little to do with except to specify the mode of wiring, the fuse-boards, switches, cables and wires, and their insulation, joints, and casings. For large blocks of building, the architect should consult one of the many expert electricians or engineers engaged in the work. It is unnecessary to recall the advantages of electricity over gas, such as the less heat evolved by the incandescent lamps, steadier light, the more efficient distribution and arrangement for decorative effect, greater safety, a healthier atmosphere, and the equally valuable advantage it possesses over gas, viz., that ceilings, walls, decorations, pictures, plate, &c., are not affected, and the consequent saving. The architect should leave the installation, with certain provisions, in the hands of the electrician, and the supervision of the work should be intrusted to him. There are certain points about which the architect may exercise his judgment, such as the kind of casings and their section, switches, fuse-boxes, wall-brackets, ceiling-roses, the kind, and the number, the lamps are to be arranged and grouped, specifying the number of lamps in the room to be lighted at one time without switching on the whole number. These certain groups of lamps must be specified to be on separate switches, or the contractor is likely to carry out the work in the easiest manner; and all the materials, fittings, and accessories are to be subject to the approval of the architect, and to be carried out in strict accordance with the requirements of the supply company and fire-office, and be able to stand their inspection and tests. The architect ought, of course, to exercise his taste in selecting (if not designing) the patterns of electrolights, brackets, and other fittings. The many treatises on the subject render it unnecessary to refer to rules as to the planning or wiring of installations, no two buildings allowing probably of the same plan, as the position of meter and company's main fuse and fixtures, &c., vary. In America, where electric lighting is more largely used, the subject has been given considerable attention. It is stated that in halls where effect is required, one 16-candle lamp will serve 700 to 1,000 sq. ft. of space, or in a hall of ordinary height one lamp for 80 to 100 sq. ft. For offices the illuminating power of one lamp is placed at 20 sq. ft. to 30 sq. ft. in well-illuminated buildings, the average is one lamp for 30 to 35 sq. ft.

The improvements in incandescent lamps enable currents of 220 volts to be employed, thus dispensing with the three-wire system. In connection with electric installations, we have the provision of electric lifts. The first cost may be greater than the hydraulic-lift installation, but in the end experience has shown that, for safety and efficiency, the electric lift is equal to the best hydraulic lift. The reason is that hydraulic machinery uses the same quantity of water when fully or partially loaded unless fitted with water-saving apparatus, while the electric current used is proportionate to the load of the lift. In many of the great office buildings in the States the electric elevators are used, and these are controlled by electrical contact; and in very large buildings with several elevators a signalling apparatus, worked by push-buttons on each floor, one signalling for cars going up, and the other those going down is employed. In this connection, too, may be mentioned telephone installation, and also lightning conductors for the protection of buildings; the latter subject is still imperfectly understood, though every building of importance should be so installed. We could refer to hot-water supply and baths, gas, and motive power, and other installations, but space forbids. Enough has been said to show the importance of

these provisions of our larger city buildings, without which they are not complete. The professional architect is obliged to take them into his earnest consideration in the planning and construction, and it is necessary that he should make himself acquainted with the scientific principles upon which these installations are based. They are too often afterthoughts; the specialists are called in after the building is designed or completed to contract for them, and the consequence is disappointment or failure. Heating and ventilating or electric-light installations are planned in a hurry, and at the cost of much alteration which practically spoils the internal and external design; wires or casings are run under instead of through the thickness of floors, in order to advance the design or ornamental ceilings and walls. We can only expect better results when the installationists themselves begin to study the requirements of buildings or the taste of architects; but this ought to be a mutual affair between the designer and the expert.

THE ROYAL SOCIETY OF BRITISH ARTISTS.

THE present exhibition of this Society, in Suffolk-street is rather below the average in the number of its canvases of merit. Where we look for works of more than ordinary interest, we find the positions occupied by indifferent pictures, and this has no doubt been caused by influences which affect all societies that are not closed to outsiders. In future we are glad to hear the lady amateur element is to be eliminated or reduced, and that the Council of the Society intend to exercise more control over the admission of outside work. In the Central Gallery we pass by a good deal of work of an experimental character, on more or less modern lines, uncertain and indefinite in aim. G. C. Hatte has a large and brilliant canvas entitled "Fruit and Sunshine, Venice" (No. 2), representing the front of a fruit-stall illuminated by the sun. There is rich colour; but the point of view is not the most picturesque. The same painter's other works, such as "The Edge of the Cliff" (408), "Cornfield by the Sea," especially the large forest scene, "In Deaulnet Forest," in the South-West Gallery (197), are remarkable for skillful handling of light and shade. The last is a fine subject—a picnic party under forest trees; the sunlight on the bending masses of foliage being effective and truthful. Walter Fowler's "Early Autumn" (8) is unequal: the trees look rather mannered and lumpy, but the meadow and cattle and the management of light are vigorous. Hal Hurst has a capital scene in portrait "Mrs. Ernest Stephens" (6) in black dress and low bodice, an ermine-lined cloak thrown over chair; the face has much life and expression. Alfred S. Edwards' "Nearing Home" is true and delicately handled. We have a suggestion of Monet in Wynford Dewhurst's clever study, "A Sunny Bit from France" (18), blossom of trees in an orchard, very naturalistic and subtle in treatment. Too artificial and garish is F. Sydney Muschamp's "My Mother's Bonnet," a little girl trying her mother's bonnet before a mirror, her mother looking through a glass panel or screen. The accessories are all of the over-lavish Louis Quatorze period. Near it, J. Fitz-Marshall's "When the Heart is Young," two kittens playing (11), may be noticed as more restrained and simple. Frank Spence-Spence, in his study "Wings of Venice," the rich-toned sails of boats (22), and his Dutch subjects (226) in the water-colour room (243), and "The Edge of Larko, Pearly" (308), show the usual skill of colour harmony and subtle tones as in his "The Boat," against the grey cloudy sky and water of the low lands near Dordrecht. We must also notice J. Finnemore's Cornish

views "Near Tintagel" (23), for its rocky coast and blue sea. Charles H. Eastlake is subtle and delicate in his flatly-painted "Lingering Leaves" (27), a grey and broadly-treated subject, but too sombre for the average picture admirer. E. F. Lowcock's "Cressida" is a graceful figure study, and other clever figure studies by Haynes King, "A Toiler of the Sea" (41), "A Quiet Day in Port" (49), and Shirley Fox's study, "Miss Belle Grey," over fireplace (46), delicate in colour, may be mentioned amongst the best. An interior with ladies partaking of tea (37), has much of the conventional stiffness of society tenses, but the colours are harsh, and Allen Davidson's "Aresthusa" (32) is not a success, though it has good qualities. There is some careful painting in Alex. Maclean's "Fringe of the Rocks," a coast study, with crested waves and wet beach, and E. Borough Johnson's "Merrymakings" is a subject picture of some power. The old violin-player in the foreground, and the concertina with the dancing couples in the background, under the shade of dark trees, are well depicted. There is a want of balance and proportion in Shirley Fox's "In Strickland's Cove," ladies in flower garden. The water and blossoms is almost overpowering. Forebore in its handling is W. Tatton White's Cornish picture, "The Grevanor Road" (54); and there is much that is nice in colour, direct and convincing in treatment in Adam E. Proctor's "The Upland Fold." One, perhaps the only work of an imaginative kind is E. Cayley Robinson's "Fata Morgana" (84) on the ead wall. We remember a few exhibitions ago a very quaint and symbolic work by this master of Medieval conception, in which everyday life and feeling were handled with much power. The present work is not so satisfying. "Fata Morgana" or fairy Morgana was the reputed sister of Arthur, and pupil of Merlin. This picture shows her witch-like attribute as a vision. We cannot say from which Medieval romance Mr. Robinson has drawn his theme. Morgana is in a laurel-tree, with flames below her feet, high above the ground, while crouched in a corner of a court we see a young man half asleep who dreams the vision; and the world is rather rude, and scarcely convincing. Another imaginative composition is Chas. P. M. Cleverly's "Legend of St. Genevieve," the patroness of the City of Paris, is also unsatisfying. The sainted shepherdess is in a weird, dark forest, confronted with a fiendish shape. Near it Rupert C. Bunny has a large picture of "L'Age d'Or" (67) in a low key of colour idealising the golden age of youth. A young man and maiden repose near the sea, with a cupid at their feet; decorative, sentimental, and without grandeur. We may also note unimprovingly Alfred S. Edwards' "Een Hollandsche Vee" (60). W. H. Gore's little genre subject, a little girl and dog, "All Rights Reserved" (62); some works by John M. Macintosh (68, 74, 86). "Snowflakes," a delicate study of a girl in cloak (78), by W. M. Spittle; Beale Adams' picture of impressionism, a sunlit cliff and blue sea, "Departing Day" (80); and Val Davies' delicate handling and colour of "Cold and Clear the Gloaming Comes" (69). Sir Wyke Beckett, the president, has this time only two subjects—interiors, one of "Malines Cathedral" (81), and the other the "Interior of the Duomo, Pisa" (265). The admirable perspective and wonderful pulpit under a canopy of foliage in the first are rendered with the subtle sense of mystery, light, shade, and colour which characterise the president's work. In the Duomo the Renaissance arcades and bands of coloured marbles and vousoirs are charmingly represented in the same masterly style, and with a true perspective of colour and shadow. Near the exterior of Malines is a delightful little study of a country lane, "The End of the Day," by James Townshend, exquisite in colour and

feeling, in which autumnal greenness is the note of colour. Then we have "An Essex River," by Jas. E. Grace; "Dutch Fishing Boats," by Charles H. Eastlake, a vivid piece of colouring; "W. Peter-Watson's "The Mower" (94), a bold study of a reaper crossing a field; "Chas. Collins' "Rocky Pastures," near Falmouth (98); A. Moulton Fowler's "Exeter Quay" (100), a nice study of atmosphere and colour; "Tatton White's blue seascape (101), are works of interest. "Parted," by Mr. T. E. M. Sheard, the hon. secretary of the Society, is a touching piece of realism on a large scale. Near a cottage fire, whose embers are burning low, sit an aged pair. A neat tea-table is spread. The old man is holding the pulse of his wife, who has fallen asleep, and it may be— from the title—the last sleep that is intended. There is tenderness and pathos in the two wrinkled faces, and the handling has strength. Other works by Mr. Sheard claim attention. His "Oxford in Early Summer" (149) is clever. "A Village Salon" (240), an elderly man with his pipe, a "know-everything" of the village inn, is full of character.

A prominent place is given to Rupert C. W. Bunney's large decorative subject, "A Feather from the Wings of Cupid" (106), rather slight in its execution, but certainly able as a composition. There is almost a tapestry-like about this picture; the colour is of light, low golden key, and the grouping and drawing of the main figures skilful; but the work looks unfinished. Above it J. G. M. Borgeuse has a large picture, "Staging in California"

A coach and six horses descending a steep hill, very vigorously and skilfully painted. Fred. F. Footitt has a bold piece of impressionism, "Pont Neuf, Paris" (112), showing the well-known bridge at night lamp-lit, the reflection of the light quivering on the rippled Seine. The effect is perhaps a little exaggerated, but the painter gives the quivering, vibrating sense of lamp and haze, and the distant background of buildings. Very pleasing is W. Graham Robertson's "Sketch at Sunset" a girl in an orchard under red apples dancing, a delightful colour study. His portrait of Miss Olga Brandon (215) is a distinct success; the characterisation and expression and the large feather hat and costume are very good. Hely Smith's seascape (116), E. Dickinson's "Burning Woods" (117), Ralph Hedley's "Barn Dance" (122), John Mastin's subject from E. B. Browning's poem (123), and Adam Proctor's "Cool Shadows" are works of merit.

In the South-East Gallery, Ed. A. Fellowes-Pryne's decorative subject, the Virgin and Child (134), claims notice for its rendering of Keble's verse. W. Westley Manning's large sea-piece, "Lingering Light," with a fleet of fishing-boats, is effective. Hal Hurst paints also in his usual freedom and rich colour. "The Lover's Seat, Hastings" (142). J. D. Ferguson is an expert painter of strong Eastern sunlight and crowds of Arabs. His deep sapphire sea, sunlit turquoise sails, make a strong study of colour in "Tangiers Bay." In another gallery he gives us some brilliant water-colour studies of the Market Place El-Kasar, with its strong sunlight, and we see the same blottisches style of manipulation in other drawings (319), and his "Evening, El Kasar," a twilight effect (338). Adam G. Proctor's "March" (156) is a delightful study of a ploughed field and leafless trees and hedgerows in grey tones, and we also note Wynford Dewhurst's "Chateau d'Arques," a rich blossom of almond against a hillside. E. Whitehead's "Willows," a luminous picture of "Portsmouth Harbour" (158). In the South-West Gallery we may refer to Leonard Watt's "Baby" with doll, a clever study of childhood; to Robert Morley's "The Pied Piper," a skilful rendering of the mice in the old legend; "A Coming Champion" (186), by Bnoch Word—an old man playing chess with a boy, who has checkmated; a large view of

"Spithead" (200), by H. K. Rooke. Granville Manton's subject, "The Handy Man," Jack amusing a baby on his knees with a toy is one of the best pieces of genre. Alex. Maclean's large "Evening in the Llugwy Valley, N. Wales" (213) is weak in the rocky foreground, through which the rivulet passes. A good portrait by John Mastin of the artist is admirable (207). There are many weak pictures. "An Idle Hour" (219)—a man idling themselves on a marble terrace by the sea—is too artificial and lacks harmony of colour.

The water-colours contain several works of merit. "Evening near Rye," by F. Hamilton Jackson, is quiet in its evening charm and light (223); his "English Wayside Cottage" (263) is also redolent of the country. Frank Spenlove-Spenlove's Dutch sketches, as "Fish Sale" (226) and "Gray of the Lowlands" (293), are full of freshness and colour. Tom Browne has a clever study, "Evening," in his usual vein. Sylvester Stannard's "Nearly Dark" is excellent in effect of a rising moon. Jena W. Allison has a cottage interior, "The Hour of Tribulation" (303), a clever study of early dawn and the anxious watchers—an old woman and her daughter—which tells its own pathetic story. "Springtime in the Lambourn Valley" (315), by Leopold Rivers; W. H. C. Groomer's clever drawing, "The Two Grandfathers" (326); Lance Thackeray's "The Fair Equestrienne" (332), a semi-comic study; and works by Alfred Collister, Henry Stannard, G. Hillyard Swinestead, may be mentioned. On the screen a collection of Italian studies by Giffard H. Lenefstey call for notice. Several charming sketches of Venice and its canals and fishing-boats (392-392), Venetian sails (372), "Ponte Vecchio," Florence (366), "On the Giudecca, Venice" (377), "The Lagoons" (376), are to be seen, drawn with delicacy and feeling, and there are also many clever figure-studies by Trevor Haddon (389-397), a warm-toned drawing by Chas. E. Georges (401). In the vestibule an interesting series of black and white sketches by Robert Sauber are hung, in which may be found many clever and brilliant society and drawing-room skits, as "Gossips," "The Matinee Hat" (426), "Willing Partners" (433), "Never Miss a Train" (434)—an excellent and nervous gentleman standing awkwardly on the skirts of four ladies; "A Society Bore" (436), all exhibiting phases of life and the comical sides of fashionable society. These are all sharp and brilliant in execution.

THE QUEEN VICTORIA MEMORIAL, ST. JAMES'S PARK, S.W.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

WHEN Mr. Aston Webb's drawings were on view to the Press last July at the Home Office, we gave a fairly detailed description* of his plan for the improvement of the Mall, and the erection of the Queen Victoria Memorial to the late Queen, incorporating the heroic statue of her Majesty by Mr. Thomas Brock, R.A., in the centre of a *Grande Place* in front of Buckingham Palace. To-day the public will be admitted† at St. James's Palace to inspect the whole of the designs submitted, together with the architect's model; and we now give two views of the schemes selected for execution. The smaller drawing illustrates the original composition as seen from Buckingham Palace looking up the grand processional road, extending through the Mall beyond Carlton House-terrace on the left and St. James's Gardens on the right, by way of a circus into Trafalgar-square and the Strand. The parade ground, or "Queen's Garden," as it is to be called, surrounding the memorial itself is inclosed by colonnade and ornamental flower borders. The pavilions in front at the entrance to the Mall have been modified, as will be seen by our larger illustration, which shows a wider

opening and two obelisks surmounted by winged lions. In other respects the composition appears to remain precisely the same as when the competition took place. We are very glad that the idea submitted by Lord Escher, of the substitution of an iron grille in place of the colonnade to the rear of the statue, and running parallel to the Palace facade, has, at any rate, so far not been adopted. The design of this colonnade has been much improved by the architect in points of detail and in adapting it to the contour of Mr. Brock's statue.

The monument is 68ft. high, elevated above a raised platform flanked by fountains, and some 8ft. above the Mall roadway. It occupies an area of 170ft. by about 140ft. The present foreground in front of the Palace will be increased by about 20ft., and the elevation of the Palace will not be touched, save by the elevation of a sort of domed centre-piece, so that the ugliness of its facade generally will be all the more conspicuous. That, of course, is not the fault of Mr. Aston Webb, whose skill is perhaps as much evident in this merit of his scheme, that it does not clash with its surroundings or detract from the Palace; indeed, the facile manner in which the architect has embodied the conflicting requirements of the proposal enhances the advantage which his solution of the problem has gained over his fellow competitors. The continuation of a busy roadway round the inclosure extending from Constitution Road to Buckingham Palace, and the chief difficulty to be dealt with, and this practical necessity is really the chief objection to the site for such a monumental purpose. Some critics have over-stated this objection. Thousands will now see the memorial, placed in such a public position, who might not, had it been possible to relegate that site to a more comparative obscurity of a more dignified locality.

Mr. Aston Webb mainly won the preference by the fact that he alone of all the competitors hit upon the idea of bringing all the public traffic right round outside the parade ground inclosure, and the exhibition of all the designs submitted by invitation will at once show the great advantage of the selected design. It is a design which respects of place. Some of the unsuccessful designs were more architectural, so far as buildings were concerned; but they in this respect display a far-reaching and ambitious limit never likely to be realised. As a matter of fact, only the part of Mr. Webb's design inclosing Mr. Brock's statue is proposed to be carried out. We will not pretend to determine which of the remaining competitors should rank second in order of merit.

Mr. T. G. Jackson, R.A., so far as palatial architecture counts, deserves commendation, though it seems that he has left it open to doubt as to how his inclosing colonnade would look on the Queen's Garden. It will not prevent the difficulty by presuming the existence of banks of trees. The public traffic is brought round in this plan in front of the Palace, but there are also continuation roads leading beyond the outside of the "Queen's Garden" into the carriage-drives up the Mall. Their shapes are ugly. The plan which York Staps the square, has angle pavilions surrounded by statues, flag drapery, and obelisks where the colonnade breaks round. In the internal angles are trophies and obelisks to break the skyline. Inside this inclosure are ornamental gardens and fountains, with statuary to qualify the arrangement. The statue of the Queen is designed by Mr. Brock, is not shown at all, probably because Mr. Jackson, like the rest of the competitors, only had a rough idea of its size, and no notion of its outline and shape. The Mall side of the inclosure is occupied by an inconsequential series of piers, railings, and wrought-iron gates, and the bottom of the Drive which York Staps a triumphal Royal gateway spans the boulevard, along which, all the way, are proposed to be statues. This road, to be closed at night, is traversed by a crossway for continuous traffic at Marlborough Gate. The alternative of placing a small gateway at the Royal approach at Spring Garden, as from Trafalgar-square, is not particularly original, and resembles some of the others.

Sir Thomas Drew, R.H.A., is the only competitor who proposed to include the refacing of Buckingham Palace. He would add flanking pavilions and give the front of the building the form of the letter E. This change in the facade he manages without changing its construction, or internal arrangements so far as the main portion is concerned, though the new end wings must be reached through the present apartments. The

* See BUILDING NEWS, August 2, 1901.

† Applications for admission should be addressed to the office of the Lord Chamberlain, Stable-yard, St. James's Palace, S.W.

crinanth order is situated on a rusticated basement, but the limitation thus accepted by the present window, and the level necessarily resulted in a monotonous spacing, and the effect does not look as if it would justify the outlay. The traffic in Sir Thomas Drew's plan, right and left of the palace, must pass in front of that building and traverse the oval-shaped space in front, where the monument to the late Queen would stand. At the end of the small opening into Trafalgar-square a group of buildings flanking a triumphal archway make a distinguishing feature, choking up the space needlessly, and facing Carlton House-terrace is another block of buildings, the central portion of which at Clarence Gate an oval bridge, the processional road, and a circus at Marlborough Gate. The gateway at Charing-cross seems pinched in its proportions, and the archway looks stilted. Over the whole is a bronze heroic group.

Mr. Anderson makes an attempt in his scheme to divert the traffic and leaves the present park gates at the end of Buckingham Palace-road untouched. The inclosure in front of the Palace itself is treated with an unimportant and low balustrade and fountains placed in ornamental gardens north and south of the statue, which, in rather a commonplace way, stands upon a quadrifol pedestal with radiating piers looking towards the park. At Clarence Gate a figure of King Alfred is located, and facing Marlborough Gate is an inclosing screen with Queen Elizabeth, supported on either hand by flanking female bearing statues of St. Patrick and St. George. The Duke of Northumberland faces the Horse Guards Parade, and a Royal archway fronts Carlton House-terrace, with the Duke of Wellington on horseback. This is the only scheme which extends alterations beyond the limit of the Mall into Charing Cross, where an opening is formed through Spring Gardens.

Mr. Ernest George does not come out well in competitions, and his design is not very remarkable. He leaves the traffic to find its way into the Mall and round the Palace as best it may, right through his "Queen's Garden," which is 730 ft. long at right angles with the palace, and it has 60 ft. roadways on either side of the monument. The detailed view from the lake side of the inclosure shows how pinched-up an effect would be obtained with the inclosed flanking pavilions, in which mounted horsemen occur like-nesses from Whitehall. A colonnade with saucer-domed pavilions emphasise the opening towards the small end of this *Grande Place*, which, as a matter of fact, can hardly be called that, because the centre is occupied completely by the memorial itself and its fountains. The Queen, stilted up above the other groups, occupies a position looking up the Mall in front of the central composition, with its elongated columns of the Ionic order and radiating base, where recumbent lions are placed above the base. Statues and his bath are seen in the perspective drawn by the architect himself. In the elevational details the sculpture is well put in; but in the sketches the figures are more picturesque than dignified. Up the Mall Royal processional road are two statues at York Stairs, and four at Marlborough Gate. The central entrance facing King Charles's statue and the Strand at the foot of Whitehall. This Royal gate is just the sort of composition which might be expected from such an artist as Mr. Ernest George; but it would be more suited for a gentleman's park in the country. We shall illustrate some of the other drawings at week, when we hope to give Mr. Aston W. his plan.

The Durkenhead Town Council have decided to present a Bill in Parliament, seeking power, among other things, to expend £100,000 for gas extensions, £20,000 for water extensions, and to compulsorily acquire Hampton-square Gardens. The town council have also approved a rehousing scheme estimated to cost £10,000.

At Whitehall parish church the Bishop of Peterborough has dedicated the stained-glass window placed in the south wall, as a memorial of the late Lieut. G. T. L. Tryon. The centre light contains a portrayal of Christ surrounded by two angels leaving a crown. At the base is a representation of the new Jerusalem. On either hand are representations of St. George and the Dragon and St. Martin. The upper lights contain arms and crest of the Tryon family, the arms of Eton, and the arms of the Grenadier Guards.

THE SOCIETY OF ARCHITECTS.

THE seventeenth annual meeting of the Society of Architects was held at St. James's Hall, Piccadilly, W., on Thursday evening in last week, the chair being occupied by Mr. T. Walter Emden, J.P., L.C.C., the retiring president. Telegrams expressing regret at inability to be present owing to the pressure of municipal business in Truro and Liverpool respectively were received from Mr. Silvanus Trevail, president-elect, and Mr. Walter W. Thomas, vice-president-nominate. The following were elected:

As members: Messrs. C. Bagot, Deansgate, Manchester; Clayton Bohann, 128, Queen's-road, Brighton; and H. C. Lander, A.R.I.B.A., Arundel-street, Strand, W.C. As a student: A. Weeks, 12, Bridge-street, Bristol. The Secretary, Mr. M. Kearny Butler, F.S.A., Scotland, read a long list of nominations to be balloted upon at the next monthly meeting, and also numerous donations to the library.

THE ANNUAL REPORT.

was then read by the hon. secretary, Mr. Ellis Marsland. The council reported with satisfaction that the past year has been one of progress and development.

MEMBERSHIP.

A large number of applications for membership have been received, resulting in the addition of 23 new members, while the students' register has also increased, the total membership now being 92. The highest number of members ever recorded have died, 14 have resigned, 3 have been removed from the list, and 3 studentships have lapsed.

QUALIFYING EXAMINATIONS.

The half-yearly examinations to qualify for membership have attracted an increased number of applicants, of whom seven were successful, one candidate, Mr. A. A. H. Scott, being awarded the silver medal of the Society. The syllabus of examination has been revised and strengthened, and the council would impress upon intending candidates the necessity for careful and systematic preparation.

ARBITERS' BENEVOLENT SOCIETY.

The Society has become a donor to this valuable body, and the council trusts that those members who are not already subscribers, will join in heartily supporting the Benevolent Society, which is not so well known to the profession as it deserves to be, with which is doing a good work, and merits consideration.

PAPERS READ.

At the ordinary meetings papers were read on "Examinations for Architects," by Mr. W. Cooper; "The Art of Designing Small Houses and Cottages," by Messrs. Barry Parker and Raymond Unwin; "English Architecture of the 19th Century," Mr. G. A. T. Middleton; "Dilapidations," Mr. W. J. Jennings; "The Results of Some Tests with Fire-Resisting Materials," Mr. Ellis Marsland; and "Building Contracts," Mr. H. B. Richardson, solicitor all of which have been published in the *Building News*. The annual dinner was held at the Prince's Restaurant, Piccadilly, on April 24.

NEW LEASE OF PREMISES.

The lease of the premises at St. James' Hall has been renewed on the same terms as before, and members are reminded that the offices are open for their use during business hours. They form a convenient centre, to country members in particular, for transacting business with their agents, or for correspondence, &c., when in town. The professional journals are taken; there is a telephone, and writing materials, &c., are provided. A lantern for the society's use has been purchased.

METROPOLITAN WATER CO.'S PROPOSED NEW REGULATIONS.

The society obtained permission to be represented at the Local Government Board inquiry, and deputed the hon. sec., Mr. Ellis Marsland, district surveyor for the borough of Finsbury, to give evidence on behalf of the society. Eventually the water company withdrew their proposal.

CHANGES ON THE COUNCIL.

In December last, Lieut.-Col. Leslie, R.E., a Vice-President and Chairman of the Examination Committee, tendered his resignation of office on being appointed to a command in Bermuda; in this place the Council appointed Mr. Walter W.

Thomas, of Liverpool, as a Vice-President, Professor Henry Adams as Chairman of Examiners, and Mr. F. W. Macey to the vacant seat on the Council. Mr. H. Marsland, past president, and one of the examiners, has lately been compelled to resign office owing to continued ill-health, and Mr. J. Bartlett, a retiring member of the Council, has been nominated to the former office, the vacant post of examiner not being yet filled.

LOCAL HON. SECS.

During the past year the Council has appointed two additional local hon. secretaries—viz., Mr. Anthony Scott (Droghda) and Mr. T. Cook Mather, of White Star. Mr. Cook has been appointed local hon. sec. at Exeter, in place of Mr. J. C. Harvey, resigned.

REGISTRATION MEETINGS.

The Council has continued its policy of keeping before the profession the question of statutory registration, and meetings were convened and held in Edinburgh and Glasgow in May. The time of year selected was not propitious, and only small meetings resulted, but at Edinburgh the usual resolution approving the principle of Statutory Registration was passed, and in Glasgow, though no resolution was put, a paper was read and discussed, and the matter brought before some of the leading architects. As is invariably the case, no opposition was offered to the proposal, and a large number of communications were received from Scottish practitioners sympathising with the objects of the meeting but while it is hoped progress may be made, in the present congested state of public business any private measure of this kind can at present claim but little attention from Parliament. These meetings, of which eleven have now been held, have done much to consolidate professional opinion on the subject, and to clear away a good deal of misunderstanding as to the objects of the Society in thus supporting and carrying on the work instituted by the Registration Bill Committee, and the Society will not relax its efforts in working for a principle which it believes to be for the ultimate advantage of the public and the architectural profession.

BRITISH CONGRESS ON TUBER LOUIS.

The Council being invited to appoint a delegate to attend the Congress held in London in July, deputed Mr. Walter W. Thomas, a vice-president, who attended as representing the Society.

INTERNATIONAL TECHNICAL DICTIONARY.

The Society of German Engineers having invited the Council to appoint some member to co-operate with it in producing an International Technical Dictionary, Mr. G. A. T. Middleton, A.R.I.B.A., Member of Council, was deputed, and has since undertaken the work. He will be glad to give members who may wish to discuss across unusual technical terms in the course of their business, with a view to their inclusion.

FINANCE.

It is expected that the balance sheet, which will be presented at the November meeting, will show that the surplus funds of last year have been considerably augmented; and although disbursement must necessarily be attended by a corresponding increase in the expenditure, the working expenses of the Society may be so far reduced as to increase out of proportion to the benefits which have been thereby secured to members and the Society generally.

GENERALLY.

While the Society continues year by year to increase its membership and extend its influence, there is still plenty of scope for further efforts, and its resources can be developed and increased in proportion as the membership grows. The qualifying examinations and other restrictions to entrance into the Society delay any but the properly qualified from admittance, and progress in numbers, if sure, is comparatively slow, therefore, it behooves the members to make a special effort to introduce those whom they know to be qualified to the privileges of membership, or studentship, as the case may be, and the Council trust to have evidence of their wish to take a share in the development of the Society, and to reach through their influence a greatly increased number of applications during the coming session. No report of the Council would at this time be complete without referring to the retirement from office of its President, Mr. Walter Emden, L.C.C., who for four consecutive years has so untrillingly and generously devoted himself

S. W. Gauge.	Thick- ness.	Weight.	S. W. Gauge.	Thick- ness.	Weight.
No.	in.	lb.	No.	in.	lb.
1	3.30	12 12½	16	0.64	2.887
2	1.53	2.12	17	0.60	2.606
3	.232	10 18½	18	.48	1.980
4	.232	9 17	19	.44	1.617
5	.232	8 14½	20	.36	1.453
6	.232	7 7½	21	.332	1.264
7	.176	7 11½	22	.30	1.135
8	.169	6 47	23	.24	1.71
9	.144	5 820	24	.222	.888
10	.128	5 173	25	.20	.800
11	.116	4 58	26	.18	.720
12	.104	4 083	27	.16	.653
13	.092	3 713	28	.14	.560
14	.080	3 323	29	.13	.559
15	.072	2 910	30	.12	.501

ROUND AND SQUARE IRON—WEIGHT OF A LINEAL FOOT.

Iron.	Diameter or Side in Inches.											
	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4
Round	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
Square	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5

FLAT BAR IRON—WEIGHT OF A LINEAL FOOT.

Width in Inches.	Thickness in Inches.											
	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3
1/4	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
1/2	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
3/4	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
1	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
1 1/4	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
1 1/2	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
1 3/4	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
2	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
2 1/4	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
2 1/2	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
2 3/4	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5
3	10.6	16.1	21.5	27.0	32.6	38.3	44.0	49.7	55.4	61.1	66.8	72.5

SHEET METAL—WEIGHT OF A SQUARE FOOT.

Birmingham Wire Gauge.												
No.	Iron.			Copper.			Brass.			Zinc.		
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	
10	12.50	11.50	10.75	16	2.50	2.90	2.75	2.50	2.90	2.75	2.50	
12	12.00	11.00	10.25	15	2.38	2.78	2.63	2.38	2.78	2.63	2.38	
14	11.00	10.25	9.50	14	2.25	2.65	2.50	2.25	2.65	2.50	2.25	
16	10.00	9.25	8.50	13	2.13	2.53	2.38	2.13	2.53	2.38	2.13	
18	9.00	8.25	7.50	12	2.00	2.40	2.25	2.00	2.40	2.25	2.00	
20	8.12	7.38	6.63	11	1.88	2.28	2.13	1.88	2.28	2.13	1.88	
22	7.25	6.50	5.75	10	1.75	2.15	2.00	1.75	2.15	2.00	1.75	
24	6.38	5.63	4.88	9	1.63	2.03	1.88	1.63	2.03	1.88	1.63	
26	5.50	4.75	4.00	8	1.50	1.90	1.75	1.50	1.90	1.75	1.50	
28	4.63	3.88	3.13	7	1.38	1.78	1.63	1.38	1.78	1.63	1.38	
30	3.75	3.00	2.25	6	1.25	1.65	1.50	1.25	1.65	1.50	1.25	
32	2.88	2.13	1.38	5	1.13	1.53	1.38	1.13	1.53	1.38	1.13	

WEIGHT OF CAST-IRON SOCKET-PIES.

For a head of water 30ft. and under—

Bore.	Length when laid.		Length of Socket.		Thickness of Metal.		Weight of Cast Pipe.		Size of Joint.		Weight of Lead Joint.	
	in.	ft.	in.	ft.	in.	ft.	lb.	oz.	in.	ft.	lb.	oz.
10	12	6	3	1	1 1/2	1	51	11	3	1	14	1
12	12	6	3	1	1 1/2	1	48	10	3	1	13	1
14	12	6	3	1	1 1/2	1	45	9	3	1	12	1
16	12	6	3	1	1 1/2	1	42	8	3	1	11	1
18	12	6	3	1	1 1/2	1	39	7	3	1	10	1
20	12	6	3	1	1 1/2	1	36	6	3	1	9	1
22	12	6	3	1	1 1/2	1	33	5	3	1	8	1
24	12	6	3	1	1 1/2	1	30	4	3	1	7	1
26	12	6	3	1	1 1/2	1	27	3	3	1	6	1
28	12	6	3	1	1 1/2	1	24	2	3	1	5	1
30	12	6	3	1	1 1/2	1	21	1	3	1	4	1

APPROXIMATE WEIGHTS OF RAIN-WATER PIPES.

3in.	3 1/2in.	4in.	5in.	6in.
12	14	17	24	32

APPROXIMATE WEIGHTS OF EAVES-GUTTERS.

1/2in.	3/4in.	1in.	1 1/4in.	1 1/2in.	2in.
1	2	3	4	5	8

CORRUGATED IRON ROOFING.

usually made in sheets 3ft. to 5ft. long and 2ft. to 3ft. wide.

S.W. Gauge.	Size of Sheet.		Weight per Square Foot.	
No.	ft.	in.	lb.	oz.
16	6	2 1/2	3	363
18	6	2 1/4	2	374
20	6	2 1/2	2	383
22	6	2 1/4	2	393
24	6	2 1/2	2	403
26	6	2 1/4	2	413

If the sheets are galvanised, add 1/4th part to the weights in the table. Sheets should overlap at least 6in. and be double-riveted at the joints. A 4lb. interposition of two corrugations should be given. Three pounds of rivets are required for each square of roofing.

FOR LINES.

One cubic foot contains 6 1/2 gallons, 1 gallon of water weighs 10lb., and 1 ft. cube weighs 62 1/2 lb.

COPPER.

The most useful form for the builder in which sheet-copper is sold is in sizes measuring about 1ft. by 2ft., and described according to their thickness by the Birmingham Wire Gauge and their weight per foot super. The gauges of the sheets vary from No. 1 to 30 W.G.

WEIGHT OF COPPER PIPES PER FOOT RUN.

Brass pipes weigh a little less.

Bore.	Thickness in Parts of an Inch.			
	1/16	1/8	1/4	1/2
1in.	23	36	59	117
1 1/4in.	23	36	59	117
1 1/2in.	23	36	59	117
1 3/4in.	23	36	59	117
2in.	23	36	59	117
2 1/4in.	23	36	59	117
2 1/2in.	23	36	59	117
2 3/4in.	23	36	59	117
3in.	23	36	59	117

1in. Round copper bar weighs 2lb. per foot run.

1lb. Square " " " " " " " " " " " "

ORDINARY WASHING COPPERS.

To hold 5 gallons weighs 7 1/2 pounds

To hold 10 " " " " " " " " " " " "

To hold 15 " " " " " " " " " " " "

To hold 20 " " " " " " " " " " " "

To hold 25 " " " " " " " " " " " "

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IRON FOUNDER.

Of soft grey iron, from the second melting, cast sound and clean.

Description.	Supplied only.	Add if fixed.
In sand, as furnace bars, shaft weights, and similar articles	s. d. 6 0	s. d.
Backs and boilers for ranges, grates, &c.	11 0 1 0	
Boilers, plain or ornamental, drilled and tapped	14 0 2 0	
Cylinders, tanks, &c., in one piece	9 4 10 0	
Ditto, put together, including iron cement or red lead	11 0 1 0	
In plates, washers, pistons, posts, girders, &c., and drilling	9 3 1 0	
In hollow columns, with caps and bases, jump-posts, &c.	13 0 1 6	
Any framing, or any kind, as braces, brackets, curvatures, &c.	13 0 1 6	
Small bolts, nuts, or screws	17 0 2 3	
Add, if in single articles under 7lb. weight, purpose made	5 0 2 0	
Furnaces, soft doors, steam pipes, with W. I. fastenings	14 0 2 0	
Grates and frames for drains, gullies, &c.	10 0 10 0	
Ditto ditto, hinged	11 6 10 0	
Blinds, grilles, and ventilators	15 3 10 0	
Heads and shoes for roof trusses, including drilling	12 6 1 6	
Pipes of any thickness or length, 1 to 24in. bore, socket joints	7 0 —	
Add, if with turned and bored ends	2 9 —	
Pipes, with flanged joints, and fitted for screw bolts and nuts	7 6 —	
Cast-iron bearing caps, &c., extra only to price of pipes	3 6 —	
Sashes and frames, skylights and blinds, including drilling	14 0 2 0	
Socket shoes, with tenons, for door frames, drilled	0 2 0 4	
Ditto, for sills, by inch, per lb.	1 0 0 6	
Door frame, 4lb. each	1 0 0 6	

Cast-iron ornamental cantilever brackets, 30 in. long, each bolted and fixed to iron columns, &c.	s. d. each 18 0
Pattern for ditto, to serve for right or left side for cast-iron column, 34 in. long 3/16 diameter	10 0
Joins' G. I. manhole cover and frame, 6 in. dia., with sills only	10 0
Ditto, 24in. by 24in. ditto	66 0
Ditto, 24in. by 24in. ditto	84 0

(To be continued.)

WILLIAM MORRIS AND HIS WORK.

A LECTURE on "William Morris" was given by Mr. W. R. Lethaby on Saturday evening at the Central School of Art, Margaret Street, Alderman Alderson, the Right Hon. W. Carrick presided, and remarked that Mr. Morris was for two years—1878 and 1879—president of the school before it was transferred to the corporation, and afterwards continued to take a great interest in its welfare. Mr. Morris, though not deeply recognised, was the greatest decorative designer of the last century, and if they looked at the excellence and volume of his work, and the variety of his attainments, it was not too much to say that perhaps he was one of the first designers that ever lived. The lecture embraced the main facts of Morris's career, and Mr. Lethaby, in drawing some practical points from Morris's life and teaching, mentioned that his wonderful diversity was founded on intense concentration. His artistic life was divided into distinct periods, during which he gave all his force to the study and development of some particular art, as pattern-printing, dyeing, carpet design, and tapestry weaving, illumination printing, and so on. His study was not only of the work of look of things, but of their very elements and essence. When the firm were first producing textiles, Morris was a practical dyer; when it was tapestry, he wove the first piece with his own hand; when it was illumination, he had to find the right colour in Rome, and have a special expert paper; when it was printing, he had to explore paper-making, ink-making, type-cutting, and other dozen branches of the trade. His ornaments and the treatment of Burne-Jones's illustrations were based on his personal practice as a wood-cutter. It was a mistake to get into the habit of regarding him as a designer. With his literature he (Mr. Lethaby) would not attempt to deal. His aim, as given in his own words, was "to embody dreams in a series of pictures"; it was the written converse of his designs, as clear, positive, and noble as they. With all Morris's practical writings was bound up a philosophy of the relation of art to practical life. One of the clauses in this gospel for to-day would be on the

necessity of re-inventing our eyes, and on the immediate consequent need for cleaning England. Modern education appeared to him to be very much of what Herbert Spencer called a ceremonial institution, a thing like a Chinese lady's lame foot or a mandarin's long nails, which were as expensive useless. Here again Morris returned to the Medieval idea, in which education was not one thing but many, and a master weaver and master mason and master tailor stood much on a par with the Doctor of Letters. One was now asked to talk of art, the thing being as he so parodied, vulgarised, and abused: it smelted as if it were of stuffy rooms, it was limp with foolish trifling, and stodge with pretence. It was not so when Ruskin and Morris first made use of the word to mean the elements of good quality, reasoned fitness, and pleasantness in all work done by hand for necessary service. As to Morris was the spirit of a man put into the body of his labour: the intrinsically right principle in the making of things—work-religion.

ARCHÆOLOGICAL WORK IN INDIA.

SIR ANTHONY MACDONELL has made a report to the Indian Government on the work done in registering and describing ancient monuments, and in their preservation, by the Archaeological Department in the North-West Provinces and in Oudh during the six years of his tenure of office now drawing to a close. The archaeological operations are grouped under three heads:—(a) The revision of the list of archaeological remains, (b) Works of restoration and conservation, and (c) Preparing reports and illustrated accounts of monumental buildings.

Under the first head there is little to record, as ten years ago Dr. Fuhrer brought out a very complete descriptive list of antiquarian remains in these provinces. Since 1891, however, several valuable additions have been made in private estates, notably the ancient stupas on Mr. Poppe's grounds in the Gorakhpur District, containing authentic relics of Gautama Buddha enshrined there shortly after the cremation of the saint nearly 500 years before Christ. Arrangements have been made for the conservation of these and similar remains in association with the owners.

In regard to conservation and restoration, a great deal has been done by the Public Works Department in consultation with the present archaeological surveyor. Many valuable structures all over the provinces have been kept from decay by timely propping-up, and in some cases considerable sums have been spent on restoration works.

Agra, with its magnificent marble tombs and palaces, has received the chief attention of the local Government. The jingly stretch of ground with its barren ravines lying along the Jumna between the Taj and the Fort has been converted by Sir Anthony Macdonell into a lovely park, and the squalid surroundings of the Taj have been cleared away. A canal 15 miles long brings water to the park and Taj gardens and feeds an ornamental reservoir. The whole scene has been changed from dreary desolation into a refreshing place with shady trees and smiling lawns, and a worthy setting to Akbar's ancient fort and the sumptuous tomb erected by his grandson. It is owing to the liberality of the late Viceroy, Lord Elgin, who, after the famine, set apart 10 lakhs of rupees to be spent at the Lieutenant-Governor's discretion, that this work could be carried out, and that it was possible to undertake the restoration of the ancient buildings in Agra and its neighbourhood. The subsidiary buildings at the entrance of the Taj have been cleared out and repaired. In the Fort, the Diwan-i-Khas, Khas Mahal, and Jahangiri Mahal have been overhauled, and repairs have been carried out to Akbar's tomb at Sikandra, the beautiful imperial mausoleum of Humayun, the Chini-Ka-Rauza, and many buildings at the deserted royal city of Sikandra, where Akbar held court. We are told that Lord Curzon during his visit to Agra in December, 1899, made a minute inspection of the tomb at Sikandra, and the portfolio of Sikandra, and of Fatehpur Sikra, and perforce detailed instructions for further repairs and conservation, so that Agra will now be more popular as a sight-seer's paradise than ever. Sir Anthony's review mentions the excellent work done by the present archaeological surveyor, Mr. E. W. Mackenzie, in publishing a monograph and portfolio recording and illustrating the most beautiful specimens of Moghal architecture, a style blending

the bold Mohammedan outlines of arch and dome, with exquisite details indigenous to India. Akbar's tomb at Sikandra has been surveyed, and the drawings are ready for publication. Mention is also made of Mr. Vincent Smith's monograph on the excavations made by Dr. Fuhrer at the Kankali Tila at Muttra, and of the work by the same author on "The Remains near Kasia in the Gorakhpur District." The chief raison d'être of the Archaeological Department is the careful search for and investigation of ancient remains, with a view to shedding light upon the ancient history of the country. This can only be done by systematic excavation of ancient sites and deciphering of ancient inscriptions.

STANDARDISATION OF HEAVY FLANGES.

TWENTY-EIGHT of the principal valve and fittings manufacturers in the United States have, as the result of a conference, agreed to a standardisation of flanges for extra heavy fittings, to take effect from Jan. 1, 1892. As will be seen from the table, the numbers of bolts for flanges for different pipe sizes are arranged in multiples of four, this recommendation being similar in this respect to the schedule of standard pipe flanges adopted July 18, 1894, at a conference of committees of the American Society of Mechanical Engineers and the Master Steam and Hot-Water Fitters' Association, with representatives of leading manufacturers and users of pipe in the United States. The second recommendation, which also is provided in the schedule of standard flanges referred to, is that drilling should straddle the vertical axis—that is, that the bolt-holes should be arranged symmetrically with respect to the vertical axis of the flange. The distance from centre to centre of bolts does not exceed 3 1/2 in., except on flanges of 2 1/2 in. pipe. In this case the committee at first proposed eight 3/16 in. bolts; but sample elbows and flanges were drilled and bolted together, and it was found that the use of eight bolts interfered with their insertion. The distance from the centre of bolt to the edge of the flange, it is recommended, should always be equal to or exceed the diameter of the bolt plus 1/16 in. for 9 in. valves and under, and the diameter of the bolt plus not less than 1/16 in. for sizes larger. The bolt diameter should be the use of a gauging record on pipe-flanges, provided such device is specified.

FLANGE DIMENSIONS FOR EXTRA HEAVY PIPE WORK.

Size of pipe.	Diameter of flange.	Flange thickness.	Diameter of bolt circle.	No. of bolts.	Dia. of bolts.
in.	in.	in.	in.		in.
2	6 1/2	1 1/2	5	4	1 1/8
2 1/2	7 1/2	1 1/2	5 1/2	4	1 1/8
3	8 1/2	1 1/2	6 1/2	4	1 1/8
3 1/2	9 1/2	1 1/2	7 1/2	4	1 1/8
4	10 1/2	1 1/2	8 1/2	4	1 1/8
4 1/2	11 1/2	1 1/2	9 1/2	4	1 1/8
5	12 1/2	1 1/2	10 1/2	4	1 1/8
5 1/2	13 1/2	1 1/2	11 1/2	4	1 1/8
6	14 1/2	1 1/2	12 1/2	4	1 1/8
6 1/2	15 1/2	1 1/2	13 1/2	4	1 1/8
7	16 1/2	1 1/2	14 1/2	4	1 1/8
7 1/2	17 1/2	1 1/2	15 1/2	4	1 1/8
8	18 1/2	1 1/2	16 1/2	4	1 1/8
8 1/2	19 1/2	1 1/2	17 1/2	4	1 1/8
9	20 1/2	1 1/2	18 1/2	4	1 1/8
9 1/2	21 1/2	1 1/2	19 1/2	4	1 1/8
10	22 1/2	1 1/2	20 1/2	4	1 1/8
10 1/2	23 1/2	1 1/2	21 1/2	4	1 1/8
11	24 1/2	1 1/2	22 1/2	4	1 1/8
11 1/2	25 1/2	1 1/2	23 1/2	4	1 1/8
12	26 1/2	1 1/2	24 1/2	4	1 1/8
12 1/2	27 1/2	1 1/2	25 1/2	4	1 1/8
13	28 1/2	1 1/2	26 1/2	4	1 1/8
13 1/2	29 1/2	1 1/2	27 1/2	4	1 1/8
14	30 1/2	1 1/2	28 1/2	4	1 1/8
14 1/2	31 1/2	1 1/2	29 1/2	4	1 1/8
15	32 1/2	1 1/2	30 1/2	4	1 1/8
15 1/2	33 1/2	1 1/2	31 1/2	4	1 1/8
16	34 1/2	1 1/2	32 1/2	4	1 1/8

BRITISH AND IRISH BUILDING STONES.—XXXI.

BASALTIC.

THE rocks here are Old Red Sandstone, with conglomerate and limestones, Dalradian mica, and other schists and slates, with slates and limestones. Granite, Diorite, Hornblende rock, Serpentine, Gabbro. Basalt is built on altered clay slate, alluvium, and mica schist. Gabbro, quartzite, quartz schist, mica schist, red sandstone, Eocheers, mica schist, beach, old red sandstone, Portsoy, mica schist, Gabbro, epi-diorite, Hornblende schist, granite, and greenstone. A great part of the area of this county is occupied by much altered Dalradian rocks, which, though extensively used for rough walling, do not, from their crystalline or semi-crystalline nature, lend themselves to being worked for dressings. Old Red Sandstone is found along the coast from Buckie to Port Gordon, from which it extends as far

South as Rathlin in Elgin, on both sides of the river Esy, there is also an exposure south of Colinton. Oil red is quarried at Alforsk, Gamrie, and Blackblacker, but these quarries are of little importance, the stone being in local use only. Formerly slates were quarried in these rocks at Loderfourie and Tarrinmouth, both near Ruthven. The Dalriadan rocks are worked chiefly for lime, the principal quarries being Blackblacker. The Blackblacker Lime Co., Ltd. (32 men); Borkmore, Dufftown, Mr. J. Kemp; Dalrath, Dufftown, Mr. B. Robertson 12; Linnelick, Grange, Mr. A. Elder 9; Richmond, Dufftown, Mr. A. Cowie 8; Timinver, Crachie, Dufftown, two quarries employing about 4 men each; Hilton, Ruthven, Mr. J. Dawson 2; and Forbyree, Mr. McElhone. Granite is found in the south in Bon Aven, in the centre at Charvatt, and in the north between Knock and Portsoy. None of these masses are extensively worked for granite, there being only three quarries of any note, employing only a few men each. Knockrath, near of Ruthven, and Forbyree. Whinstone is quarried at Jarrowden, Auchtermuchty, Enzie, and Oran, in the parish of Ruthven. The limestones of the Devonian rocks along the coast are in some cases found altered to marble or serpentine, as at Portsoy, a stone which was at one time selected for decorative work, the most notable place in which was employed being Versailles. Though the rocks here produce a great variety of stone, suitable for rough walls and quins, there is a dearth of freestone suitable for dressed work, and for all good buildings these are imported.

BERWICKSHIRE.

The rocks of Berwickshire are Carboniferous Limestone, Calcareous Sandstone, with cement stones (420'), Old Red Sandstone 410', Upper Silurian Shales, and Slates of Llandovery age. P-élite, Basalt, Coldstream is built on Lower Carboniferous rocks of the Calcareous Sandstone type. Dumse: Upper Old Red Sandstone, Calcareous Sandstone, and Cement Stone. Greenlaw: Upper Old Red Sandstone. Lauder: Upper Old Red Sandstone, Alluvium.

Carboniferous Limestone extends in a narrow band along the coast from Berwick-on-Tweed to Burnmouth. Here the limestone differs lithologically from Berwickshire, being a variety of limestone where it is better developed than in any part of Europe. The Irish limestone is grey, fine grained, compact, and almost wholly composed of calcium carbonate, in fact on the south side of Galway Bay this limestone is 1,600 ft. thick, without an inch of shale or other rock at the bed. It is composed of broken encrinurids. As the Lower Carboniferous rocks of England approach Scotland they become more and more intercalated with sandstone, shale, and coal, until at last the limestone remains in bands only, separated by much thicker deposits of sandstone and shale. In fact the Carboniferous Limestones of north-west Northumberland and Berwickshire so essentially different from those of Berwickshire that geologists have classified the lower carboniferous rocks of this district as "Berwickian" and "Tudian," the former covering the Berwickian, and the latter the Tudian. The Berwickian is a very distinct line of demarcation in some places. Both series consist of alternate beds of limestones and sandstones of very changeable character, which pass gradually into the normal grey mountain limestone horizontally, as the beds range south to Berwickshire. The beds of limestone in the Berwickian Carboniferous rocks are usually distinguished by special names, those in the district along the coast north of Berwick being known as the Lamberton or Dun Limestone. There are few quarries in the Carboniferous limestone north of Berwick, and the same reason for the lack of limestone in the Berwickian is a name given to the lowest division of the lower carboniferous rocks in Scotland, and it furnishes some of the best building stones found in the country. In the south of England a series of beds of limestone shale is found between the Carboniferous Limestone and the Old Red Sandstone. The beds are called the Lower Limestone Shales, and the Scottish Carboniferous Sandstones appear to represent these shales as well as portions of the Carboniferous Limestone itself. The main fault to be borne in mind is that the Scottish rocks are older than the English. The best all-round building stones are in the geological horizon as the lower limestone of the southern England and central Ireland. The sandstones of Berwick occupy a large area in the south-east of the county.

Berwick along the White Adder

Rivertown Dumfries defines the northern boundary, whilst on the east and south they reach the Tweed and pass northward by Greenlaw to Duns. In this area there are the following quarries: Whitstone Newton, near Duns, Messrs. Steel and Co. 12 men; Salfinton, worked by the same proprietors 8 men; Coldstream, Messrs. Wm. Smith and Sons 5; Kimmerghame, Duns, Mr. J. J. Cowper 2; Tolhaugh, Edrom, Messrs. Gibson and Dickson 3; and Edington Mill, Chirnside, Mr. S. Craig. The Whitstone Newton quarry is the most important. The stone is fine-grained and easily worked, the colour a warm cream. Unfortunately, it is not a very reliable weather stone, for it shows signs of failure where used in Edinburgh and other places. Nevertheless, the stone has been used for walling and dressings in all the chief buildings of the county. Old Red Sandstone is seen on the coast between Eyemouth and St. Abbs' Head, and again at Cockburn Path. The former extends a few miles inland, and belongs to the Lower Old Red, whilst the former, being the Upper Old Red, passes south of Duns and Greenlaw to Hume and Easterton. Both divisions of the Old Red are worked for local use only, and Upper Silurian rocks of Llandovery age occupy the rest of the county. They are grey rocks and grits, being durable and regularly jointed; they furnish good stone for ordinary walling, the dressings being of Calcareous Sandstone, Permian or Triassic. None of the Silurian rocks are suitable for the purpose. The sedimentary rocks in this county are everywhere invaded by igneous rocks, such as basalt, porphyry, felsite, and other kinds of trap, and these are worked for road metalling. Aytoun Glen, built with Old Red Sandstone, quarried at Harelaw. From the foregoing it will be seen that the only quarry of more than local interest in this county is that at Whitstone Newton, in the Calcareous Sandstone, and that this belt of rocks furnishes the most valuable stone for walling and dressings of any found in Scotland.

MUTHILL.

This county consists of seven islands—Bute, Arran, Great and Little Cumbrae, Inchmarnock, Mull, and Mull of Galloway. The rocks of Bute are Dalriadan Schist, Clay Slate, and Basalt, with small exposures of Calcareous Sandstone and Old Red Sandstone. Rothsay is built on Alluvium, Old Red Sandstone, and Quartzite. There are no quarries of any importance in Bute; limestone is found in the Dalriadan schist. Mull of Galloway has a mass of granite occupying the north-central part, around which, on the east and south sides, is a belt of Lower Old Red Sandstone. A band of Upper Old Red Sandstone crosses the island from Lamlash to King's Cove; in fact, it forms the whole south of the island except where broken through by basalt and porphyry, which latter occupy a more extensive area than the sedimentary rocks. The granitic mass referred to above is bordered by mica schist. A very narrow band of calcareous sandstone is found along the coast on the extreme north-east. Lamlash and Brodie are both built on Old Red Sandstone rocks. There is an important quarry in the Lower Old Red Sandstone at Corrie, worked by Messrs. J. McGregor and Co.; it gives employment to 60 men. The other sandstone quarries are Balmicheal, Shishmoo, and Stronach, Messrs. G. and R. Cousin, Stronach, Brodie, Trustees of the late Duke of Hamilton; Monymore, Lamlash, ditto; Largiemore, Whiting Bay, ditto; and Darneoch, Shishmoo, worked by the County Council, Mr. P. Jenkins, surveyor. In Great Cumbrae there is Old Red Sandstone and mica schist, and in Little Cumbrae porphyry of Lower Carboniferous age. Basalt is found in both islands. Inchmarnock is chiefly mica schist. Holy Island and Mull are both quartz porphyry and basalt. The granite of Arran is sometimes quarried; it is called "Craig Dhu." Bannan. The igneous are metamorphic rocks in these islands are used for rough walling, and the sandstone for dressings; the only important quarry in the county being that at Corrie.

CATHNESS.

The rocks here are Old Red Sandstone 365'; Dalriadan; Schistose and Gneissose rocks not yet differentiated and granite. Thurso, Wick, and Caithness are all built on Old Red Sandstone. This is an Old Red Sandstone country, more than three-fourths its entire area; that portion lying to the north-east of a line from Reay to Berriedale, being of that formation. The Old Red Sandstone here, which is 20,000 ft. thick, and

consists wholly of the lower divisions of that formation, is regarded as furnishing the well-known "Caithness Flags," which are extensively quarried all around Thurso, and shipped from that port. Thirty years ago the value of the flag used in this county was £75,000. The chief quarries worked by the Caithness Flagstone Co., Ltd., of Thurso, and these are Castle Hill, Ollrig 112 men; Ahscharhead 88 men; Kirkhill, Ollrig; Stoneyon, Ollrig; and Holburnhead, Thurso. The Thurso Caithness-shire Pavement Syndicate, Ltd., work the Wydale, Janetstown, and White-moss (quarries with 108 men). The other quarries are Langland, Mr. J. Gorry; Southend, Wick, Mr. D. Miller; and White Moss, Mr. H. Campbell, the two latter being slate quarries. Caithness paving from Banniskirk, Thurso, was laid in Trafalgar-square, London. A series of experiments with slabs of Caithness Craighead, Ollrig, and Caithness flagstones gave the following results in arriving at the unit of strength: Hales 353 lb., Craighead 510 lb., Arbroath 821 lb., and Caithness 1,500 lb., the unit of strength being deduced by taking the breaking weight of each rock, and dividing by the area of the stone, dividing by the depth and by the section of fracture. Caithness Flags are dark coloured, bituminous, slightly micaceous, and calcareous sandstones. There are no important quarries in the granite or schists, and the introduction of concrete, worked by the late Mr. Gorry, has greatly reduced the demand for all kinds of natural paving.

CLACKMANNAN.

The rocks are Coal Measures 350, 375', Millstone Grit, Lower Carboniferous Limestone Series, Old Red Sandstone altered, Porphyry, Diorite, Alloa is built on Alluvium and Coal Measures. Clackmannan: Alluvium, Basalt, and Calcareous Sandstone. This is a small county, the southern part of which is occupied by Carboniferous rocks exclusively, and the north by various intrusive igneous rocks. The Coal Measures are bounded on the east side by Millstone Grit, known locally as "Moor Rock," and there is a small exposure of Carboniferous Limestone. The igneous rocks which are found occupying the whole north of the county above Tillyculter consist of Porphyry, Tuff, Agglomerate, and Diorite, all contemporaneous in Old Red Sandstone. Coal Measure Sandstones furnish the building stones of the county, and the basalt and diorite are the principal quarry being Craigie, Clackmannan, Messrs. G. and R. Cousin, who employ 35 men in it. There is a sandstone quarry at Devon, Alloa, worked by Mr. G. Cousin with 15 men; one at Bankhead, Alloa, worked by Mr. J. Phillip with 10 men; one at Sande, Kirkcaldy, on Forth, worked by the Trustees of the late Thomas Peattie. The only other quarries of any importance are the Whinstone quarries at Craighead and Gloomhill. The trap rocks are used for walling and road metalling. The Carboniferous Limestone of Vicar's Bridge is burned for lime.

DUMFRIES.

The rocks in this county are Coal Measures, Carboniferous Limestone, Calcareous Sandstone, and shales. Old Red Sandstone 350', Dalriadan quartzite, Schistose, and Micaceous Rocks, Porphyry, and Tuff. Dumfries is built on Alluvium and Calcareous Sandstone. Helensburgh: "Old Red," white sandstones, and limestone, calcareous sandstones, and shales. Dumfries: "Kirkpatrick Hill," Millstone Grit, and Carboniferous Limestone. This county is long, narrow, and of irregular shape, lying north-west and south-east, the various strata crossing it in bands transversely. The long strip of low ground between Loch Lomond and the Clyde, in the valley of the Leven, and on which Dumfries and Alexandria are built, cuts transversely across the following formations, commencing on the north: 1. Lower Old Red Sandstone, consisting of grey and brown felspathic flaggy sandstones, and 2. Upper Old Red Sandstones, consisting of red calcareous and red and white silicious sandstones. These extend along the Clyde from Carradous to Dumfries, and inland along the county boundary from Dromglass to Dumfries Moor. Between this latter place and the Clyde, Calcareous shales and cement stones are developed. Kirkpatrick Hills, east of Dumfries, are Tuff and Porphyry, interbedded with calcareous sandstone; whilst farther to the east, from Old Kirkpatrick to May Hill, the rocks are Carboniferous Limestone with coals. To the west of Helensburgh there are

Red and White Sandstones and cement stones of the Calcareous series, whilst the rocks farther north are Dalradian Shales, Grits, and Limestones. Dumbarton Castle stands on a volcanic rock. Carboniferous Limestone is quarried at Cumbernauld and Murreok Glen. The Calcareous Sandstones are Dalradian, Messrs. Paterson, Ltd. (41 men); Auchincroch, Jamestown, Messrs. Auchincroch Quarries, Ltd. (29 men); Dalreoch, Dumbarton, Mr. W. Bailey (13 men); Temple Maryhill, Messrs. Paterson and Son, Ltd. (11 men); Bonhill, Mr. J. Bailey (7 men); Millburn, Alexandria, Mr. Bissland (6 men); and Netherwood, Cardross, Messrs. Paterson, Ltd. (2 men). Mr. Phun (5 men). Some of the Whinstone quarries, of which there are several, employ as many as 70 men. On the Geological maps of this county the Calcareous Sandstone series is grouped with the Old Red Sandstone.

DUMFRIES.

The rocks in this county are New Red Sandstone, Permian (371, 372, 408, 409), Calcareous sandstone, shales, and Limestones. The New Red Sandstone, Upper Silurian, Lower Silurian, Porphyry, Trap, Luff, and a small mass of Granite. Annan is built on a raised beach and New Red Sandstone. Dumfries: Permian sandstone and Breccia. Lockerbie: Graptolite shale and Permian sandstone. Upper Silurian rocks of Llandovery Castle. The Permian sandstone, New Red Sandstone (Trias) is found in the south-east of the county, extending from Annan along the mouth of the Esk to Canobie, and inland to Eaglesfield. The building stones quarried in this district are in the same geological position as those of Longtown, in Cumberland, already described. The Permian sandstone in the Triassic rocks are Corschill, Annan, Messrs. J. Murray and Sons (157 men); Cove Kirkpatrick Fleming, The New Cove Quarries, Ltd. (123 men); Annanlea, Kirkcubright, Symington's Quarries, Ltd. (42 men); Annan Heath, Annan, the G. M. (120 men); and Springwell, Kirkpatrick Fleming, the Springwell Quarries, Ltd. (12 men). Underlying these Triassic sandstones are the Permian rocks of Dumfries, Thornhill, and Lochmaben, the latter extending as far north as Moffat. The chief quarries in the Dumfries district are: Auchachings, Messrs. Baird and Sons (190 men); Dalreoch, Messrs. Baird and Halliday (144 men); Milgaiton, Dalrigg, Messrs. W. Fares and Co. (15 men); Kilroy, ditto (13 men); Bankwood, Messrs. Henston and Robinson (5 men); and Craigs (Mr. W. Boyd 4 men). In the Thornhill district are Cleburne, Messrs. Freestone Quarries, Ltd. (102 men); and Gatchley Burn, Messrs. W. Thomson and Son (66 men). In the Lochmaben district is Cornecockle, Lockerbie, Messrs. Benson and Co. (122 men). The Dumfries red sandstones are used locally, and exported to all parts of England, as well as to Dublin and towns in the north of Ireland. It will be seen that they belong to two different geological formations—the Trias of Annan, and the Permian of Dumfries, Thornhill, and Lochmaben. The Coal Measures are found to the west of Sanguhar, where they are worked for sandstone at Burr by Mr. S. Gibson, and at Buccleuch clay by the Buccleuch Coal Co., Ltd. Calcareous Sandstone is found along the Solway Firth between Annan and Ruthwell, it extends inland, passing Ecclefechan and Langholm to the county boundary along the Liddle Water. At White there are three small sandstone quarries worked by Mr. Hyslop, Mr. Hyslop, and Mr. Telfer; but the importance in the limestone of this district. They are: Kelhead, Annan, Mr. A. Watson; Bonshaw, Burnhead, Ferguson's Trustees; Harlaw Hill, Mr. M. C. Yerstoun; Calchreale, Kirkpatrick Fleming, Mr. J. C. Johnson-Ferguson; and Blackwood Ridge, Burnhead, Mr. Richardson. The Kelhead limestone is too hard to be used for building; hence it is, like other limestones, burnt for lime. The Silurian rocks are found in three distinct lands running across the county from south-west to north-east, and occupying more than three-fourths of its entire area. The eastern band passing under the Permian rock of Dumfries and Lockerbie is of Ludlow and Wenlock age. The central band, extending from Thornhill to about five miles beyond Thornhill and Moniaive, is of Llandovery age, and the other or western band is the graptolite shale of Llandoyle, Canada, &c. All these Silurian rocks are greywackes, grits, flagstone, and blue laggy shale, which give from the rough walling at Stone, but more suitable for dressed work at Barbowrie, near Moniaive, the shales have been

worked for roofing. North-east of Ecclefechan there is a mass of porphyry, and a basalt dyke crosses the county in a north-westerly direction from Langholm passing south of Moffat, and over the county boundary into Lanarkshire. Feliste is found near Durisdeer, and there is a small mass of granite, especially in Glenahilly Hill. No quarries of any importance in the igneous rocks of this county. The Silurian rocks are used locally only. The same may be said of the Calcareous sandstones; but the Red sandstones of the newer formations are now favourite building stones, though they do not stand well in London. Tied in rock give employment to about 100 men in quarrying and working, for many of the quarries send out dressed stone.

EWART'S SAFETY GEYSERS.

THE illustrated catalogue of Messrs. Ewart and Son, Ltd., of 346-350, Euston-road, just issued, contains a large assortment of the most improved and complete water-heating appliances, baths, and other fittings. Several new features and improvements are noticeable in this catalogue, to which we direct our readers' attention. These comprise new methods for the instant production of hot water for various purposes by means of gas or oil. No more need be said of the "Califont" which can be used to heat the water in any part of a house of several stories. A section is given on p. 12 which shows by red lines the application of Ewart's "Califont" fixed in basement to any number of taps on any floor, while the section also shows in green the application of the "Acme" fixed above the draw-off taps. By either of these useful inventions hot water can be instantly obtained night and day to bath, sink, lavatory, &c. The advantage of the "Califont" is that it may be fixed in any out-of-the-way part of the building. One pipe only ascends from it through the floor, with the necessary connections to bath, lavatory, sinks, and bedrooms. Simply turning a tap insures a supply of hot water, which action raises or lowers the gas in the "Califont," which may be 100ft. away in the basement. This valuable apparatus thus dispenses with the hot-water boiler in the kitchen and the night chamber, and saves considerable value. The "Califont" supplies hot water under high pressure equal to that of the cold-water supply without circulation, if desired, feeding a tap above or below level of apparatus, such a flow of water averaging from one to eight gallons per minute. Ewart's "Lightning" geyser is too well known to need description here; its value has been attested by a long experience. It is not a fixture, like a boiler, but can be unscrewed and removed. A hot bath or supply can be obtained almost immediately, it occupies little space, and can be fitted to any boiler, &c.; and its price ranges from £5 to £50, according to size. Larger sizes are now made. We see on one page a capital combination of geyser with shower-bath arrangement and lavatory supply, called the "Acme" geyser. This patented apparatus is an instantaneous water-heater, supplying hot water to both directly the gas is lighted, and at any temperature desired. A less expensive model is Ewart's "Champion" geyser, constructed to work without water pressure. Hot water can be obtained instantly after lighting the gas, and it is very simple and economical, as there are no parts to get out of order. The geyser is made of stout, hardened copper, inside coated with pure tin, and the cost is very low, for country houses, to £45. It is useful for bottle-washing and laundries. Ewart's oil geyser, Pattern C, is another modification of the last type, and will be found useful when boiling water is not required, although Pattern L insures this result. Improvements have been made in the "Success" geyser, which is useful for country houses, and it is too costly or cannot be hidden. The "Bar" geyser is another improved type, and shows a new departure, specially designed for supplying boiling water for hotels, bars, refreshment-rooms, railway buffets, hospitals, &c. No. 36 "Bar" boiler produces four gallons of boiling water per minute, and after the first minute the production is at the rate of four pints per minute. There are several sizes of these geysers, and the supply each yields is given on the page. The "Albany" gas circulating boiler, for connecting to radiators, greenhouse pipes, &c., is a most useful appliance, made in three sizes, 9 in., 12 in., and 15 in. diameter, and 2 ft. 6 in. high. Several other applications of the geyser and appliances for heating, suitable for

bathrooms or lavatories, also fittings, are illustrated in this useful catalogue, and many suggestions will be found of value to the architect, engineer, and general public. The catalogue is replete with illustrations of every geyser, Ewart's baths and fittings, the "Euston" radiator for gas, and contains descriptions and prices that will be of value to the architect.

BOOKS RECEIVED.

Workshop Winkles for Decorators, Painters, &c. Edited by WILLIAM NORMAN BROWN (London: Scott, Greenwood, and Co., Ludgate-hill, E.C.). This little book will be found a useful compilation of "winkles" chiefly intended for those who "want to find the means of doing a certain job in a hurry." We do not believe in doing anything in a hurry, and lists of recipes are not always a satisfactory way of learning a trade; but this little book does not profess to instruct, but only to give information about a multitude of things which are instantly useful to the decorator in a more complete kind. Thus, under the head "Preparing Stencils," the author says "the best material for paper stencils is a heavy manila paper; that a day or two before using it should be tucked up somewhere and given a good wash or two of linseed-oil. This renders it of the requisite pliability, in cutting the design the edges should be laid on a sheet of glass, to insure sharpness and evenness, a very sharp knife being used." The articles on "Adulteration of Paints" is a useful summary of the chemical methods used to find adulterants. The most common adulterants of pigment are sulphate of barytes and chalk, and the detection of these is described. The tests given are by qualitative analysis as well as by quantitative analysis. Under "Decoration" we have all kinds of mastics, varnishes, wood imitations, cabinet-work, polishes, stains, enamelling processes, gilding preparations for walls, stencilling, and methods of decoration treated in a concise form. From a casual glance over the pages of this book the information is reliable, though "scissors and paste" must have had its share in the compilation.

The Sanitary Inspector's Handbook, by ALBERT TAYLOR, M.S.I., &c., third edition, with illustrations by LEONARD TAYLOR, M.S.I., &c. (London: W.C.I.), is a useful guide to the sanitary inspector as well as to the municipal surveyor. We noticed Mr. Taylor's work when it first appeared. It has been enlarged and revised. The author deals with all the duties of the inspector in abatement of nuisance, the service of notices, and legal proceedings, book-keeping, &c. The subject of house-drainage and fittings, waste pipes, traps and gullies, ventilation, also infectious diseases and disinfection, meat inspection, slaughterhouses, lodging-houses, factories and workshops, dairies, &c., are discussed, and a plan is given of the drainage of a town mansion. The illustrations of types of closets, gullies and traps, and various fittings, the proper methods of ventilating soil-pipes and traps, joint lead and stoneware pipes are useful. The provisions of the Public Health Acts applicable England and Wales and the Metropolis, and the Public Health (Scotland) Act, 1897, enable the law to be compared. To save have been added the by-laws of the London County Council relating to the construction of drains, water-closets, soil-pipes, &c. To all students and architects this handbook will be useful, also as a book of reference to provisions and by-laws relating to buildings generally.—*Land Surveying: Its Theory and Practice*, by SAMUEL SARGENT, F.S.I. (London: F. P. Wilson) is a useful textbook for students working for the professional examinations, and will be found a handy book of reference, later, by the busy practitioner. The examples given are clearly and fully figured.—*First Stage Building Construction*, by W. B. CLIVE, University Tutorial Press, 117, Drury-lane. This work, one of the Organised Science Series adapted to the first stage or elementary course of the Board of Education, now being brought out in 2s. each. It contains numerous rough but effective illustrations of the various subjects in the first part, in a simple and lucid manner, with Brickwork, Masonry, and Slatting, and, in the second section, with Carpentry, Joinery, Plumbing, and Ironwork. An excellent feature is the full index at the end of the volume.—*The Construction of Roads and Streets*, by HENRY L. CLARK, D. N. CLARK, and J. E. CLARK, F.E.S., 3rd edition, revised and enlarged by A. J. WALLINGTON, C.E., with numerous illustrations

[London: Crosby Lockwood and Son.]—The sixth edition of this practical work on road construction has been much enlarged by the addition of chapters dealing with the latest developments of street and road construction, introducing the new materials and the latest appliances, methods of construction, and maintenance. The subjects of rolling, wood and asphalt pavements, cost of macadamised roads, traction, pavements of various kinds, cleansing &c., have been fully dealt with. The earlier chapters by the late D. K. Clark and Henry Law give the student a sketch of the subject and the principles of road construction. The student will find remarks on selection of route, levels, contour lines, bench-marks, and sections; on earthwork and drainage, embankments and cuttings, resistance to traction, modes of marking sections of the road, the use of instruments, estimating quantities, in addition to valuable data on materials, such as stone and wood; pavements in Liverpool, Manchester, London; tramways, and many useful tables as to the cost and wear. Diagrams, plans, and sections explain the various systems. The editor has referred to several lectures, to various papers and experiments on roads and pavements, and the subject is brought up to date by numerous examples of curbing and paving materials, and references to cast-iron curbing, blue-brick curbs and channels, and the methods of cleansing by machines, jet and hose, and the various methods of experiments are given in tables. The appendices contain much useful information on rolling, the by-laws in operation in the Metropolis, &c. All connected with road and pavement construction and their maintenance will find the volume a repository of results, experiments, and data.

Classic Architecture: a Series of Ten Plates Illustrating Typical Examples of the Grecian and Roman Orders, with full details and ornaments, for students preparing for the May examinations of the Board of Education, School of Royal Academy, R.I.B.A., &c., by CHARLES F. MITCHELL, Lecturer on Architecture to the Polytechnic, Regent-street, M.S.A., &c., and GEORGE A. MITCHELL, Lecturer on Architecture and Construction to the Polytechnic School of Architecture (London: B. T. Batsford, 94, High Holborn).

This atlas of ten plates, giving typical examples of the Greek and Roman Orders, which has been prepared for students preparing for various examinations, especially for those in Architecture and Honours Building Construction. The plates are well and clearly drawn to a module of 30 parts, or a semidiameter of the column, and for comparison the three Greek Orders and their columns drawn to one length, and those of the Roman to another. The best authorities have been consulted on the selection of examples, and the authors have been assisted by Dr. Murray of the British Museum and others in the examination of the fragments. Each order is briefly described, and a plan of the temple given to a small scale. Taking the Doric order from the Parthenon, we have indicated the maximum entasis .057ft. measured at two-fifths of total height of column, the detail of anulets taken from existing capital in British Museum, sections through entablature in the Parthenon, the solid showing guttae, a small plan of the temple, with separate scales of modules for general order and for details, and this is generally followed in all the Orders. The Greek Ionic is from the Erechtheion at Athens, and the Greek Corinthian from the Temple of Minerva at Lycabettus, Athens. The selections of Grecian ornament from buildings include details from the Parthenon, Temple of Nemesis at Rhamnus, Erechtheion, Temple of Ceres, Eleusis, &c., and the examples of Roman ornament are equally well selected. The Roman Orders come from the Temple of Mars Ultor at Vicenza, the Theatre of Marcellus, Trajan's Forum, the Vestibule, and Temple of Castor and Pollux, and arch of Septimius Severus, all at Rome. The atlas will form a necessary addition to the library of every student and architect.

Bricklaying and Bricksetting, by H. W. HUGHES, Examiner in Brickwork, Masonry, and the City and Guilds of London Institute, &c., over 200 illustrations (London: Longmans, Green, and Co.), is intended to cover the City and Guilds of London Institute's examination on this subject, both in theory and practice, and to meet the Board of Education's examination in building construction. For these courses it is admirably fitted; it will also be found a comprehensive textbook to assist bricklayers in their trade, and for the use of architectural students generally. The examples illustrative of bonding are very complete,

and comprise all the leading bonds of joints and thin and thick walls, the bonding of reveals of openings, the bonding of angles, obtuse and acute, as in bay windows. The subject is thoroughly explained by means of diagrams, and the bond of chimney stacks, gables, hollow walls, hopper bond, jointing, gauged work, arches, and cutting is illustrated. Ornamental brickwork in niches, corbels, labels, cornices, pilasters, dentils, reveals in moulded work, architraves, panelling, pediments, is described and the operations illustrated. To square and cube work, to find the quantity of digging to trenches and concrete; also how to measure brickwork and to take the extra for facings, including pointing. The rules for multiplying certain quantities and to find areas of circular openings are useful, and the specifications given for brickwork, the memoranda, the City and Guilds of London Institute's Building Act, glossary of terms, and the technological examinations on brickwork given by the City and Guilds Institute (the syllabus of which is given) are valuable additions. The work is one of the best handbooks we have seen, and its price is well justified by the quality of the work.

Building Construction, by CHARLES F. MITCHELL, Lecturer on Building Construction to the Regent-street Polytechnic, Head Master of the Polytechnic Technical School, M.S.A., &c., and GEORGE A. MITCHELL, Honours Medalist Building Construction, &c., Advanced and Honours Courses. Third edition, revised and enlarged. (London: B. T. Batsford, High Holborn).—We have on previous occasions spoken favourably of this excellent and comprehensive handbook, which comprises in a moderate-sized octavo volume all that is necessary for students preparing for the May examinations of the Board of Education, the Royal Institute of British Architects, the City Guilds, Civil Service, and other professional examinations in building. The course has been extended, both in the text and the illustrations, by chapters on American Iron and Steel Construction, the by-laws of the Local Government Board and London County Council, by forms for specifications for leading trades; the subject of

Sanitation has been revised by Mr. J. Wright Clarke, and additions have been made to the chapters on Materials, Foundations, Vaulting, Domes, and Bridge Construction, Roof Coverings, &c. The illustrations of tooling, such as plasterer, plumber, &c., are useful. In a chapter on Foundations we find the theory of pier and foot resistance worked out by numerical examples, and the depth of concrete shown by calculation, grillage explained and illustrated. Under Brickwork, sections are given showing the application of cement, lime, and bituminous compounds to walls of basements; the model by-law for external and party-walls is given in tabular form; flues and tall chimneys are treated, and the theory of resistance to wind and other pressures is worked out mathematically. Several illustrations of trussery and stonework, drawn to a good scale, and of Masonry and Vaulting. In the Joinery division we find examples illustrated of wooden ribbed ceilings, coffer, working drawings of sliding doors, shop-fronts, and the subjects of hot water supply, warming, and ventilation are well explained and illustrated. In preparing for examination the papers of the Board of Education, Secondary Branch, South Kensington, will be found of service. Messrs. Mitchell's handbook is a valuable epitome of the subject, and every student will find it indispensable. —*Public Health and Housing*, by JOHN F. J. SYKES, A.D. W. (London: B. T. Batsford, 94, High Holborn).—This is a reprint of the Milroy Lectures delivered by the author this year before the Royal College of Physicians upon the influence of the dwelling on health in relation to the changing style of habitation. In Part I, Dr. Sykes treats upon the ascertained effects on health of certain conditions of dwelling. As to the results of density in square area and in cubic space, the author frankly admits that such ratios are not reliable means of comparison, even when the conditions of water supply, sewerage, and refuse removal are similar, but points out that urban mortality is highest in districts towards the centre of a city, and lower towards the periphery; is most marked in children under five years, and in diseases affecting the respiratory organs. In large blocks of artisans' dwellings the relationship of houses to each other is immensely improved, and the cubic areas, he shows by statistics the beneficial effects of wide streets and rear spaces, while that the prevalence of infectious diseases is proportionate to the increased number of inmates in a house is easily demonstrable. Dr. Sykes condemns narrow streets, and small back streets, and calls back-to-back areas, and shows how certain defects in dwellings, such as deficient light, dampness, coldness, decay, and dilapidation tend to an increase in preventable diseases. In Part II, the author deals with construction and misconstruction, a suggestive chapter being that on the construction and management of flats and other dwellings. Part III, treats on the usage and misusage of houses, including lodgings, separate and self-contained dwellings. The registration of dwellings is insisted upon, and in a concise chapter dwells on the necessity of the registration of dwellings, and much to the disadvantage of the former, in which sanitary conveniences are often separated by many flights of stairs from a large proportion of the inmates. Part IV, gives a brief review of the housing question, and a useful appendix epitomises the regulations of the Act of 1900, and the existing regulations of the London County Council. This useful work is published at 8s. net.

Practical Plane and Solid Geometry, by JOHN CARROLL, Art Master and Examiner in Drawing, is a capital series of lessons on problems in practical geometry for science and art schools, and for the use of teachers and students. This work has the merit of making mathematical principles the foundation of the problems, not mere memory. The author has taken the "identity of principle" as the basis of his classification—thus each principle forms the subject of a separate lesson, and the problems that exhibit a common principle are grouped together; thus the principle that "the angle in a semicircle is a right angle" is applied to four distinct problems in which right-angle construction is involved. The type is clear, and the diagrams well drawn and of good scale. In the problems that exhibit a common principle have been added on the construction of curves used in mouldings, arches, patterns, and decoration. We can thoroughly recommend this book as a very useful one for the architectural student and decorative artist.

Building Intelligence.

BERMUDSEY.—The housing committee of the Bermondsey Council are considering a proposal to purchase 7,250 square yards of land adjoining Southwark Park-road for about 20,000 as a site for municipal dwellings for artisans. The site is about to be vacated by a firm of engineers, and the borough surveyor has planned accommodation for 400 rooms, being 10 of three rooms, and 140 sets of two rooms. If the London County Council allow the buildings to be erected five stories high the weekly rental per room, including rates, &c., is estimated at 1s. 4d., and if four stories high, 3s. 8d.

BLAIRS, N.B.—At Blair College, the institution for the training of the Scottish priesthood, which is prettily situated on the Kincairdineshire side of the Forth, about six miles from the city of Aberdeen, the new chapel was dedicated last week. It is the gift of the Right Rev. Monsignor James Lennon, Liverpool, and is decorated in style, from designs by Mr. Robert Curran, architect, Warrington. Cruciform in plan, it is 120ft. long, with a nave 35ft. wide, and side chapels 10 ft. wide. The roof is of the wide span. It is Rubialsal and Kenney granite. The altar is constructed of Sicilian, Carrara, Irish, and Numidian marble, and together with the reredos, which has not yet been erected, is by Messrs. Pearce and Sons, Dublin. The centre panel of the reredos contains a representation of the Vinci's "Last Supper," and in the side panels of Carrara marble, the side panels being filled by figures in the attitude of adoration. Three stained-glass windows are placed in the wall behind the altar. Provost Tochetti gave £2,000 towards the internal furnishings, so that, when the tower is finished, the cost of the chapel will be about £5,000.

FORBESBURG.—The Rainy Hall, New College, which was opened a year ago, has now received the decoration originally intended by the architects. The architecture of the hall is 15th century in style. The roof, an open-timbered one, with the hammer beams resting upon carved stone corbels, is divided into six sections by massive main rafters. The hammer beams are connected by the upper ribs of the roof, which are carved and gilded. The flat soffits over the windows and the upright parts of the ceiling over the hammer beams are divided into panels, which are filled with painted ornament in primary and secondary colours in keeping with the style of the wall. The cornice dividing the soffits from the upper panels has also been relieved in primary colours, with the carved ornament in solid gilding. The upper section of the roof is divided into panels with moulded ribs, and the panels have chevron bands of blue and red colour, which are relieved by ornaments of fleur-de-lis and roses in pale yellow. The walls of the hall are fitted with wainscot to the height of 10ft., and are divided by decorative buttresses into bays to correspond with the bays of the roof. The cornice at the top of the wainscot dado is carved, the ornament representing the vine; the foliage is in solid gilding and the fruit in red and blue. The upper panels and oil painted in blue with stencilled ornament. The floor is of alternating bands of blue and red in shades of red. On the walls are hung portraits of Moderators and Professors, the place of honour being given to a kit-kat portrait of the Principal Rainy, above the platform. The electrolytes are in wrought iron, finished in the style of the silver. There are shields on the stone corbels which support the hammer beams, and the corbels of the carved spandrels between the principals of the roof and on the ends of the hammer beams. These shields—forty-eight in number—have been filled in with the coats of arms of the nobles who joined the Covenanted party in Scotland. There are also shields with the Royal arms of England, Scotland, and Ireland, and with the arms of the University towns and Universities in Scotland. The heraldry, as borne in 1638, has been specially drawn for the shields by the architects, under the direction of Mr. John Balfour Paul, the Lyon King-of-Arms. The work has been carried out by Mr. James Clarke, George-street, under the instructions of the architects, Messrs. Sidney Mitchell and Wilson, also of Edinburgh.

FOOTS CRAY.—A new steeply, which has just been added to the parish church, was dedicated on Saturday by the Dean of Norwich. The old Kentish timber and shingle style of steeple

which has been associated with the church for hundreds of years has been reproduced. The work of construction was entrusted to Messrs. Stubbins and Pannett, of Foot's Cray and Sidcup, and they have carried out the designs of Mr. Boucher, of the firm of Drake and Boucher, architects, Rochester. The work has cost altogether £600.

HESWALL.—The Right Hon. Walter H. Long, M.P., president of the Local Government Board, laid on Friday the foundation-stone of the hospital for the treatment of persons suffering from leucis which is being erected on a high-lying site of 10 acres at Heswall by the Joint Hospital Committee for the West Derby, Liverpool, and Tenth-century Poor Law districts. The main front of the building will face due south. The outside facings will be carried out with Connal's Quay bricks, relieved by red pressed Knabon brick stringing and arches. The administrative block will be placed in the centre. Immediately in front on the first floor an open-air sun bath, divided for both sexes, is to be placed. On either side of the administrative block there will be two wings two stories high containing dormitories for the treatment of patients. To every patient 1,000 ft. of air space will be allotted, and the dormitories will be connected with the main block by corridors. The total cost of the land and buildings is estimated at about £12,000. The hospital is being carried out from the designs of Mr. Charles H. Lancaster, of Liverpool, architect to the joint committee. Mr. Thomas Spencer, Aintree, is the contractor.

LIVERPOOL.—The new Central Technical School was formally opened on Saturday. The style and character of the edifice, of which Mr. E. W. Mountford, F.R.I.B.A., of London, is the architect, has been determined by its immediate proximity to St. George's Hall, the Museum and Library, Picture Reading Room, and the Walker Art Gallery. The general plan consists of two wings, each about 160ft. long, running east and west, parallel to William Brown-street and Clayton-street respectively, and connected on the Byron-street side by a curved frontage, in which the main entrance is situated. The ground floor contains the administrative offices, the large lecture hall, and the examination hall. The first floor above contains the rooms devoted to the work of the Nautical College, classrooms and lecture-rooms for building construction, mathematics, and other subjects. The basement floor is mainly given up to workshops and laboratories. The stone used for the structure is a hard sandstone belonging to the millstone grit series, and obtained from the Stancliffe Quarries in Darley Dale, Derbyshire. The front corridor and the vestibule on the ground floor are lined with grey encaustic marble from Derbyshire, while the columns and pilasters in the vestibule are of Devonshire marble from Torquay.

LONDON COUNTY COUNCIL.—At Tuesday's meeting of this body the General Purposes Committee reported that thirty applications had been received for the post of chief engineer and county surveyor, in place of Sir Alexander Binnie, who retires at the end of the present year in order to devote himself to private practice. The committee submitted the names of three candidates, and recommended that the Council should appoint Mr. Maurice Fitzmaurice, chief engineer of the waterworks department, and formerly chief engineer for the Council on the Blackwall Tunnel. The other gentlemen named were Mr. Charles Elwin, general and Parliamentary assistant in the engineers' department of the Council, and Mr. E. G. Mawbey, engineer and surveyor of the city of Southwark. Mr. Elwin, who, however, wrote withdrawing his acceptance, explained that his services had been retained at Leicester on terms satisfactory to himself. The salary of the office is £2,000 a year. The recommendation was adopted, and Mr. Fitzmaurice returned thanks for his appointment. A long discussion took place on the subject, and the Council, on the recommendation of the Working Classes Committee relative to the Providence-place and King-street areas, Poplar, which it was proposed to deal with as an insanitary area. The committee recommended that an estimate of £18,600 for carrying the scheme into effect be agreed to. It was objected that the work of the drainage department would be increased for an area which, when the houses are removed, will only be worth £1,500; but it was pointed out that to pay less would be impracticable until an alteration in the law was made, and the report was eventually adopted.

PAISLEY.—In memory of Mrs. Archibald Cants, who took a warm interest in the Scottish Girls' Friendly Society, a club and institute, to be used in connection with the society's operations at Paisley, have been erected in New Street. The buildings were formally opened last week by Lady Georgina Home Drummond. The main building will be utilised as a club, while adjoining it is the institute, which will be devoted to educational purposes. The ground floor of the club contains the master's apartments, dining and sitting-rooms for residents, besides a kitchen and laundry accommodation. The first floor has five single-bedded rooms, two rooms with four beds in each, and two rooms divided by screens into four cubicles each. The second floor is similar in arrangement, and both are equipped with lavatory accommodation. The educational institution stands back 30ft. from New-street. On the ground floor are two classrooms, measuring 19ft. by 18ft., and 18ft. by 15ft., separated by a sliding partition, so that the two rooms can be thrown into one when occasion requires. There are also cloak-rooms and lavatory. Upstairs, the first floor is similarly arranged, with addition of superintendent's retiring-room. The buildings are erected of Lochaber red stone, style being a free treatment of the Scottish domestic type of architecture. Mr. T. G. Abercrombie, Paisley, was the architect.

SOUTHWARK.—The Bishop of Rochester opened on Monday a Chapter-house for St. Saviour's, Southwark. The building was founded in 1219, and was used as a church until about twenty years ago. It is situated in St. Thomas-street, Southwark, in the neighbourhood of Guy's Hospital, and next door to the Collegiate House. Since the building has been taken over by St. Saviour's it has undergone several alterations, and has been thoroughly cleaned and redecorated, the architect being Mr. Arthur Bartlett. A feature of the house is a fine old oak gallery which runs round the northern and western walls. The reredos and Communion-table, also of oak, have been allowed to remain, and the old chapel seats have been broken up and utilised for the purpose of panelling the walls.

STAFFORD.—Considerable progress has already been made with the extensive new works which Messrs. Siemens Brothers & Co. are erecting in field-road, and the contract for a portion of the brickwork and general building has just been let to Mr. H. Lovatt, of Wolverhampton and London. The main siding is about 1,800ft. in length, and runs almost parallel with the Lichfield-road up to the Queensville Bridge, where it curves round and connects with the goods line of the London and North-Western Company's system. Mr. Lovatt's contract amounts to £10,000, and comprises a building some 500ft. long by 50ft. wide, which will be used as the erecting and testing shop. Other buildings for which the contracts have not yet been let will comprise the machine shop, the wood-working shop, and saw-mills. The works are to be completed in about eighteen months.

TRURO CATHEDRAL.—At Friday's meeting of the Diocesan Conference the Cathedral Building Committee reported that the erection of the nave up to the last week in June had been carried out in a way that appeared to be entirely satisfactory to the committee, as well as the architect in loco, the architect, and the contractor. The nave piers, walls, triforium, and clerestory, as well as the western towers and front, had grown in height and beauty in a manner that impressed everyone who visited the works. Serious anxiety and painful disappointment had been caused by the fact that eight of the East Stone bases of the piers had shown signs of fracture more or less serious. Investigation showed that there was nothing amiss with the foundations, or any settlement of the buildings, for no cracks or fractures can be discovered in the walls or arches. Everything pointed to some local cause, the condition of the Bath stone having been the most likely. It had passed since the cracks were first noticed there have been no signs of their enlargement in direction or width. In a letter to the committee, the architect, Mr. F. L. Pearson, states that "it is clearly a case of imperfect bedding: the plinth stones rest upon a damp, uneven bed of Bath stone, and the masonry above them has settled." The committee added that the cracked stones could be replaced, if necessary, by a very costly and possibly dangerous process, involving the underpinning of the arcades. But before undertaking so serious an operation, they had decided, with the concurrence of the archi-

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ILLUSTRATIONS.

SELECTED DESIGN FOR QUEEN VICTORIA MEMORIAL.—
NATIONAL SILVER MEDAL DESIGN FOR A CATHEDRAL
CHURCH.—GOVERNMENT AT BEDFORD.—FARMHOUSE EDWARDS
HARVEY, LIVERPOOL.—SPECIAL SERVICES FROM
VARIOUS SOURCES.—HUNTING BOX, GREAT BOWDEN.

Our Illustrations.

QUEEN VICTORIA MEMORIAL, ST. JAMES'S PARK.

For description of the selected design by Mr. Aston Webb, A.R.A., see page 579.

A CATHEDRAL DESIGN: NATIONAL SILVER MEDAL AWARDED.

A Gornic cathedral had been determined upon for erection in Liverpool, and even now, although the committee in charge of the scheme has this week determined to leave the matter of style an open one, it may well be assumed that a predilection exists still among the members in favour of a Medieval church. Probably, therefore, some aspiring architects who intend to take part in the competition which is now being advertised are turning their attention, perhaps for the first time, to a study of the Medieval style, and presumably the committee in asking for a Gothic design, had in mind a more or less correct modern rendering of either 13th or 14th centuries' detail. We published all the designs for Liverpool Cathedral in the former competition, and these appeared in the *Building News* for Jan. 19, 22, 29, Feb. 5, 12, 19, 26, March 5 and 12, 1886. On the 12th of April last we printed a design after the pure Early Gothic style by Mr. Fred. Wilkinson, for which a National Silver Medal was awarded, and to-day we publish a longitudinal section showing the nave, choir, and central tower of the same composition. It recalls the days when Sir Gilbert Scott won St. Mary's Cathedral at Edinburgh in a competition held about thirty years ago. To erect such a building in such a transient style in any case nowadays, and of all places in the world in Liverpool, would be an unqualified mistake. It all depends upon what the promoters intended by 'Gothic.' The medieval manner is the best of modern Gothic temples, buildings, save those in the most rigid phase of the Later Renaissance, is due to the Gothic spirit which pervades their conception and general idea, though their details may be based upon Classic types and proportions more or less in degree. We can but think a mere Gothic Revival cathedral would be desirable from an architectural point of view, no matter how accurate its style might be or how learned its parts archaeologically considered; though, on the other hand, even this would be preferable to an ill-digested conglomeration of gleanings from all sources strung together for novelty sake, and a small 'Gothic' cathedral without vastness and scale would only look like a toy.

DOVECOT, BEDFORD.

This dovecot was made in deal and painted. It accommodates 20 nests, and is carried by shaped bracket beams framed into a stout square post. It stands 16ft. high out of the ground. The work was executed by Mr. White of Bedford. It was designed by Mr. W. A. Forsyth.

THE FARMHOUSE EDWARDS LIMEHOUSE DISTRICT PUBLIC LIBRARY.

Next Wednesday, the 6th of November, this building is to be opened. The site for the library is situated at the corner of Commercial-road and Norway-place, with open space in the rear, and that the reading-rooms, &c., can be lighted from three frontages. The frontage of the land to Commercial-road, the most important thoroughfare in Limehouse, is about 55ft., and the depth from north to south is 138ft., or about one-sixth of an acre. There will be a liberal space between the Commercial-road front and the public front; but it was decided that the interior should be reached on the east side, that the public part should have its floor just above the public pavement, and occupy the whole ground floor; the basement being used for stores, assistants' room, heating, &c., a residence for the librarian being put upon the upper part, near the Commercial-road. The accommodation on the ground story for the public will be a news-room for seventy readers, lofty, and 27ft. by 38ft., placed near the entrance as being the room most frequented, and readers in the reference and magazine-rooms, placed at the south end of the site, will be lighted from Commercial-road and Norway-place by large windows with semicircular heads. A room for the Commissioners and chief librarian, 13ft. by 18ft., will also be provided adjoining the entrance from Commercial-road. The corridor leading to the reading-rooms, the news-room will be 8ft. 6in. wide, and the inner hall from which the newsroom and residence will be reached will be 12ft. by 14ft. The lending library is placed in the centre of the building, entered from the main corridor, and will have counter space 30ft. long. The space for the public, 9ft. by 21ft., is enclosed by framed and glazed partitions. The book-shelves in the lending library can hold about 10,000 books, and further accommodation for about 6,000 books is provided in the basement, where are also rooms for assistants, binders, and the heating chamber. The lending library is lighted by windows looking into Norway-place, and by large lantern lights round the centre of the building, the whole work of the library is supervised by the assistants at the counter of the lending-library. The reference and magazine-room, 41ft. by 19ft., at the south end of the site, will be lighted by windows looking south into a garden. Sixty to 70 readers of reference-books and magazines will enjoy perfect quiet in this portion of the building, well removed from traffic, within and without. A room for the sub-librarian has been placed between the lending-library and reference and magazine-room, so as to be reached readily by students for consultations. The heating of the building is by hot water at low-pressure, radiators being put in all the rooms and corridors. The lighting will be by gas for some time to come; electric-lighting is ultimately intended when that light can be installed. The building is an endeavour to realise a pure Renaissance style, most of the architectural features being executed in Portland stone, and the rest of the external work will be of yellow stock brickwork. Messrs. Sahay and Son, of St. Peter's-street, Islington, are the builders; and Messrs. Clarkson, of Great Ormond-street, are the architects.

SKETCHES FROM VARIOUS SOURCES.

The revival of garden architecture has increased of late an interest in the character and design of pedestal sundials suitable for formal lawns and paved inclosures. These few sketches of some old specimens, therefore, may be useful and suggestive. The names of the places from whence the subjects come are given on the sheet. They date from Roman to modern times.

HUNTING BOX, GREAT BOWDEN: THE STAIR CASE.

We published a plan and view of this country house in our pages for September 20 last. To-day we give a sketch of the staircase. We have no further particulars of the work than those already given. Messrs. Coles and Johnson are the architects.

The Duke of Cambridge on Saturday afternoon opened a new drill-hall at Hendon. The hall is situated in the Hendon-road, and is capable of drilling 250 men at a time.

Sir Frederick Treves opened on Friday the new bacteriological laboratory at the Bristol Royal Infirmary. The laboratory has been built from designs by Mr. A. P. I. Cottrell, of Bristol.

WATER SUPPLY AND SANITARY MATTERS.

LEIGH-ON-SEA.—The urban district council of Leigh-on-Sea are taking immediate steps to prevent a recurrence of the James Munster water which was experienced in that town during the last summer, and have retained the services of Mr. Bailey-Dunton, M.Inst.C.E. (Messrs. Bailey-Dunton, Son, Lawford, and Symonds) as consulting engineer. It is intended to proceed with the further boring of the well, and effect other remedial works during the coming winter.

MAIDSTONE.—The corporation is now definitely committed to a new scheme of sewage disposal. Under the advice of Mr. James Munster, President I.C.E., the corporation have resolved to provide new works on a site opposite the existing tanks at Allington. The system of treatment proposed to be installed is bacterial, and, exclusive of the capital cost is estimated at £3,900. The selected site, known as Pepper Alley, is 25 acres in extent. The purchase price of this land, engineer's commission, and incidental expenses will, it is calculated, absorb an additional £14,000, making £17,900 altogether. Borrowed on the sinking fund principle at 6 per cent., this will involve an annual charge on the borough of £1,200, and to this has to be added a sum of £1,050 for the working expenses, making a total of £2,250. The working expenses at the present tanks amount to £1,400 per year.

CHIPS.

An adjudication in bankruptcy has been made in the case of George Veale and George Carter, trading as Veale and Carter, Mill-lane, Brixton, S.W., builders.

At Tuesday's meeting of the town council of Edinburgh, payment was ordered of a further sum of £3,000, making £30,750 to the D.O.K. Kerr, and Co., for construction of cable tramway tracks, &c., and intimation is made that a twenty-first instalment of £2,335, making £19,686 10s., has been paid to the same firm for diverting; piers, junctions, &c., &c.

At the last meeting of the Poplar Board of Guardians the general purposes committee reported that they had received 132 applications for the post of engineer-in-charge, 79 applicants for the assistant engineership, and 14 for that of fitter. The several candidates were called before the board, and after an interview with each of those selected, Mr. Lewis B. Giles, at present engineer-in-charge of electric generating plant at Messrs. Yarrow and Co., was appointed engineer-in-charge.

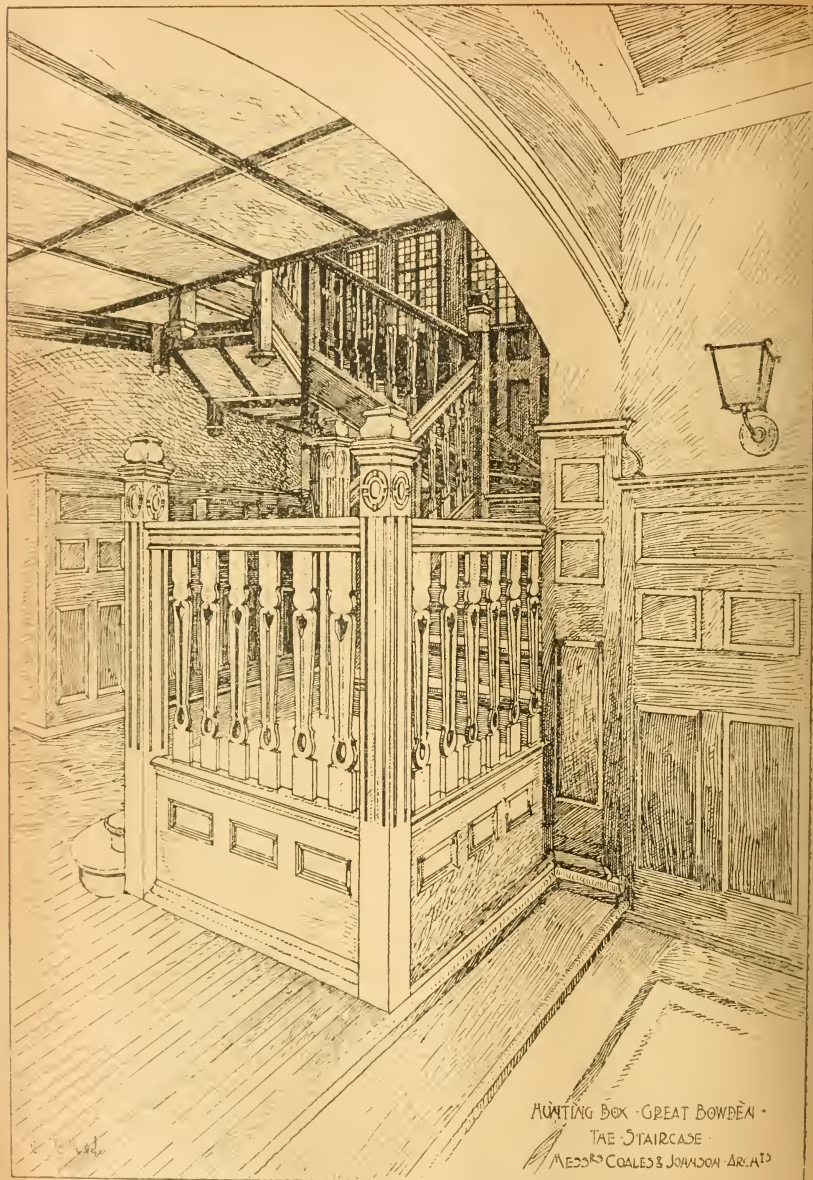
The town council of Aberavon will join with the Neath Rural Sanitary Authority in the promotion of a Bill in the next session of Parliament to carry out a comprehensive scheme of water supply, which embraces the whole area of the Neath district. The estimated cost is £175,000, Aberavon's share to be not more than £25,000.

The city council of Newcastle-on-Tyne have adopted a report by the Town Improvement Committee relative to the housing of the working-classes to be displaced by the city improvements. The Local Government Board require that a fresh scheme should be prepared, showing accommodation for at least 300 people. Consent was given to the use of single-tenement dwellings. A draft scheme will be submitted to the Local Government Board, showing accommodation for 35 additional people, bringing the total to 311. The extra cost will be £1,700, the cost of the original scheme being £12,000. At the same meeting a report by another committee, in relation to the appointment of a city engineer, was submitted to Mr. Leys (resigned), and submitting the names of three selected candidates—Messrs. Elge, Swindlehurst, and Steele—was withdrawn, and will be brought up again at a more convenient time.

The models for the proposed statue of Queen Victoria, to be erected in St. Mark Church Park, Ipswich, have been on view during the present week in the Mayor's parlour at the town-hall. Four were sent in, and the choice of the committee has fallen upon a design which exhibits a life-size figure of the late Majesty in bronze, with sceptre and orb in either hand, seated beneath a stone canopy. The canopy is surmounted by effigies of the late Majesty and Queen Victoria, and a tablet on the pedestal bears the inscription: "That God who protect and abundantly bless my country may my fervent prayer.—VICTORIA R."

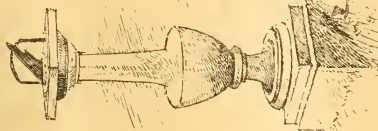
The Tricakenham Urban District Council have adopted the proposal of the Central Committee for the Preservation of the Richmond Hill View to convert Marble Hill estate into a public park, managed by the London County Council, Tricakenham, man paying £3,000 towards the total of £72,000 purchase money.

The interior of the parish church at Metley has been renovated at a cost of £3,000. A new heating apparatus has been fixed, and the ancient stained glass lights introduced. The reopening of the church by the Bishop of Ripon took place on Saturday.

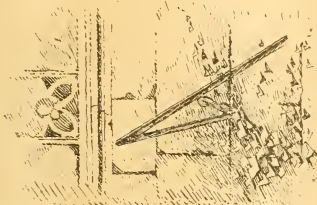


HUNTING BOX - GREAT BOWDEN -
THE STAIRCASE -
MESSRS COLES & JOHNSON - ARTS

SUNDIAL IN
CAULANA
CHOREVARD
in CANTERBURY.



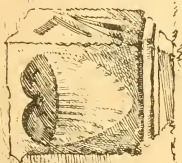
SUNDIAL ON BANQUETING
HALL WINGFIELD MANOR.



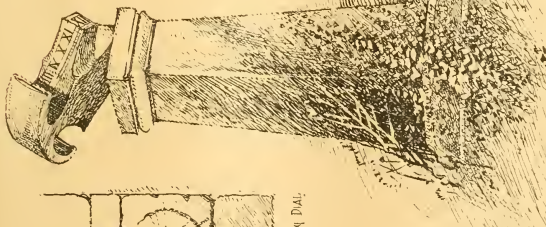
SUNDIAL
WILKINLOW
CHESHIRE.



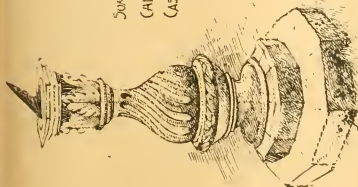
ROMAN SUNDIAL POWER
HOUSE.



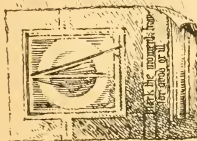
IN THE DEANERY GARDEN
ROCHESTER.



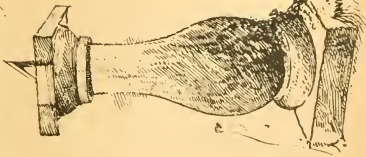
SUNDIAL IN
CAULANA
CASTLE.



REMAINS OF ROMAN DIAL
AT LYNGE.



SUNDIAL
STRETTON
CHESHIRE.



SUNDIAL SKETCHES FROM
VARIOUS SOURCES

W. J. P. 11

LEGAL INTELLIGENCE.

EXITS FROM LOFTY BUILDINGS IN FLATS.—At Westminster, on Monday, Mr. Justice Atkinson, sitting at the instance of Mr. A. W. Reekards, the building owner of a large block of high buildings let as flats at Buckingham-gate, was summoned for penalties under the London Building Act of 1894 for allowing occupation of the stores over lifts, from the ground level without a County Council certificate that there were adequate means of escape in case of fire. It was stated for the London County Council that the plans hitherto submitted were inadequate and unsatisfactory. At present staircases were the only means of escape. Last July the defendant was fined at this court in respect of these flats. Fresh plans had been submitted, but they were not yet accepted by the Council. Mr. Biron, counsel for the defendant, said that a builder was placed in a position of great difficulty because no definition of what was actually required could be obtained from the County Council. The defendant was most willing and anxious to do all the Council demanded, and for plans to be approved he asked for an adjournment. Mr. Horace Smith thought that this was reasonable, and granted a month's adjournment. It was stated that the Council would accept no responsibility.

RE SYDNEY KNIGHT.—A first meeting of creditors was held under this failure before Mr. G. W. Chapman, Official Receiver, on Monday. The debtor had carried on business as a builder and contractor at 347, New King's-road, Fulham, S.W., and his statement of affairs showing liabilities £33,348, of which £32,274 18s. 3d. was returned as unsecured, and assets estimated to produce a surplus of £689 28s. 41. It appeared that the debtor had failed on a previous occasion. In 1897 he failed on building speculation, in consequence of the erection of flats, &c., at Hurlingham and Wimbledon, and he also erected houses at East Sheen and Waltham Green. He endeavoured to sell the flats to a syndicate, but stated that his endeavours were unsuccessful owing to the war. He does not contend that he is insolvent, and attributes his position to undue pressure by creditors and to other causes. His new position was now made, and Mr. E. W. Davis, chartered accountant, was nominated as trustee to administer the estate in bankruptcy, a committee of inspection being appointed.

CORPORATION'S OPTION AS TO APPROVAL OF PLANS.—In the King's Bench Division, on Friday, before Mr. Justice Chitty, Mr. Justice and Mr. Justice Byles, it was sought to obtain a writ of *habeas corpus* upon the Mayor and Corporation of West Ham, to approve of plans which had been submitted to them by one Richardson for their approval. Mr. Richardson, being a private owner of building houses on certain plots of land which he had purchased, sent, as he was bound to do, plans of the houses he intended to erect for the approval of the corporation. The corporation refused to give their sanction on the grounds that houses erected according to the plans submitted would interfere with a public highway. The appellant contended that, since the existence of the Public Health Act in dispute, the corporation exceeded their powers in refusing to approve of the plans for the new houses for the reasons given by them; that the only question for them was whether the plans were in accordance with the by-laws as to the erection of new buildings. The Lord Chief Justice, in giving the decision of the court that the mandamus ought not to go, said that, as the corporation were the guardians of the highways, they were entitled to be consulted as to whether the erection of new houses which, in the honest opinion of that body, would interfere with a highway under their charge.

INDUSTRIAL DWELLINGS AND THE LONDON BUILDING ACT.—Alfred Bush, builder, of 69, Ridge-moor-street, was summoned on Saturday by Mr. Arthur Ashbridge, district surveyor for Marylebone, for making, in the erection of a building at the corner of Portland-street and Ashburn-place, Marylebone, default to comply with a notice of irregularity under the Building Act. Mr. D. P. Andrews supported the summons on behalf of the London County Council, and Mr. W. Moyses, barrister, defended, representing the Portland Industrial Dwellings Company, the owners of the building in question. Mr. Andrews said that the building was a large one, and was intended for the occupation of persons of moderate means, and it was agreed on all sides that the building being over 125,000 cu. ft. in extent, section 68 of the London Building Act applied. It was provided by that section that in every public building, and in every other building of more than 125,000 cu. ft. in extent, which is not constructed or adapted to be used as dwelling-houses for separate families, the floors of the lobbies, corridors, landings, and flights of stairs should be of fire-resisting material, and carried by the support of substantial material. But it was also contended by the complainants that the building, being over 25 squares, or, in other words, covering more than 2,500 sq. ft. of area, should conform with section 74, subsection 3, which required that all the floors

of the rooms, as well as those of the lobbies, &c., should be fireproof. Apart from that matter, an exception was taken to the building. In all probability a paraffin-lamp would be used in every one of the rooms in this building at night, and it was therefore of the highest importance that the floors should be fire-resisting. Mr. Moyses urged that section 74, subsection 3, only applied at large buildings like flats, containing three or four rooms, intended to be occupied by different persons, and with an outer door. The object of the company he represented was to solve the most acute problem of finding dwellings for the industrial classes in congested districts. Every one of the rooms in the building in question might be let off separately; at any rate a weekly rent would be charged per room. They, therefore, thought it was oppressive and unreasonable to try and compel them to incur the great expense of making the floors of the smallest rooms fireproof. As to the possibility of fire, he pointed out that in all probability gas, and not lamps, would be used by the tenants. Mr. Plowden, in deciding the case, said that the whole question seemed to be what was a fair meaning to be placed on the words of the Act that in every building "containing separate sets of chambers, offices, or rooms" there should be fireproof floors. In his opinion, "separate sets of chambers or rooms" do with offices or rooms, but referred simply to chambers. Every kind of room, office, or set of chambers which was inhabited at all should, therefore, have fireproof floors. Consequently, he held that this building contained sets of chambers or rooms, or, even if not sets, they contained rooms which required fireproof floors. His order would be that the defendant should comply with both section 74, subsection 3, and section 68 of the Act, and pay 25s. costs.

CHIPS.

Mr. R. W. L. Phillips having obtained the position of electrical engineer of the borough of Bedford, resigned his appointment as chief assistant engineer to the city council of Bristol, who on Wednesday last appointed Mr. H. H. Couzens as deputy city electrical engineer to fill the vacancy, his salary being fixed at £250 forthwith, and to £300 per annum at the expiration of one year.

The scheme for the construction of a combined passenger station for the E.R. and B.-N.R. at Howrah has practically fallen through. Mr. Halsey Ricardo, architect, of Westminster, was to have gone to India for the purpose of securing the scheme at the beginning, but the arrangement has been cancelled.

The Crabb Memorial Institute in Victoria-road, Tunbridge Wells, was opened on Saturday. The building is of red brick, with stone dressings. The large hall is 58ft. 6in. by 28ft., and is capable of seating 100 persons. There is a platform at one end with vestry and at the other is a large gallery, and a lantern is fixed in the front to illustrate lectures. At the rear of the building is a gymnasium, 40ft. by 22ft. 3in. There is a large reading-room in the front, and a games-room in the basement. A reading-room for men is situated on the first floor, and in the basement is a large kitchen. The architects were Messrs. H. B. and E. Cronk, and the builders Messrs. Loney.

The Isle of Wight County Council have considered at a special meeting a recommendation by a committee to accept the tender of Messrs. J. and M. Patrick to construct the public free library, technical institute, and county offices at Newport for the purpose of the technical education act. It was proposed to expend £3,600 of Sir Charles Seely's gift of £5,000 in the construction of the library and its adjuncts, and the surplus they suggested should be applied to maintenance. After a long discussion, it was decided by 29 votes to 9 to postpone consideration of the matter for 12 months.

The Secretary of State for India has appointed Mr. Francis Bustfield Armstrong to be Assistant Secretary in the Public Works Department at the India Office.

In the chapel of the Abbey Church, Shrewsbury, a new monument has been erected in memory of the late Mrs. Juson. The work has been executed by Mr. Robert Bridgeman, sculptor, Lichfield, from designs prepared by Mr. Lloyd Oswell, Shrewsbury.

In consequence of the increased demand upon the accommodation of the institution, the committee of the Richmond County Asylum at Kewley have decided to enlarge the present building, at a probable cost of about £5,000.

At a meeting of the Hebrew congregation at South Shields, Mr. Henry Grieves, of that town, was elected architect for the proposed new synagogue.

The Walmer Urban District Council have retained the services of Messrs. Beesley, Son, and Nichols, of Westminster, to prepare a scheme for extending and partly reconstructing their sewerage system, and for the treatment of the sewage on the "septic" system.

Our Office Table.

The annual conversation of the Architectural Association, marking the opening of the fifty-fifth session, was held on Friday evening last at the galleries of the Royal Institute of Painters in Water Colours, Piccadilly, and passed off most successfully, the attendance of members and friends being in excess of most recent years. The guests were received by the President, Mr. W. Howard Scott-Smith, F.R.I.A., and Mr. Aubrey Smith, who were supported by the vice-presidents, members of the committee, and the hon. secretaries. The walls of the galleries were hung with the pictures forming the exhibition of International Art, and there were also on view the prize designs and drawings executed during the past session at the studio in Great Marlborough-street, some clever and effective water-colour sketches by Mr. W. Hemmings, of Greenester, Fairford, and neighbourhood, visited by the members during the annual excursion last August, and a series of architectural photographs taken by members of the Camera and Cyclo Club. During the evening selections of music were rendered by the Imperial Orchestra, and songs were contributed by Miss Lilian Corner and Mr. Avalon Collier.

Mr. EDWIN O. SACHS gave a lecture on "The Prevention of Fire in Theatres," with special reference to the regulations of the London County Council, before the members of the O.P. Club at the Criterion Restaurant on Wednesday evening. He referred to the serious nature and extent of theatre fires, and held that these called for energetic preventive measures. To his mind the clear planning in a theatre was of greater importance to the audience than clever fire-resisting construction, and the regular attendance of reliable fire watching day and night, and especially during a performance, was more necessary than any amount of surprise visits. He considered the order of precedence for theatre safety to be straightforward planning, regular watching, skilled inspection, and good construction. The protection of life by means of rapid exit should always have the first place. The importance of the theatre as an improved materially from the playgoer's point of view since the London County Council was created, between which body and the theatre managers there had never been any great difference of opinion on the general question that the safety of the public must be attended to by some public authority, and that the public must bear half so much cause of complaint with the Council's administration if its powers had been greater in the first place, and if greater discretion had been left to its chief permanent officials, and more particularly to the superintending architect. Sooner or later the London County Council, the theatre managers, and the public would have to agree that it would be more in the interests of the community at large for the whole licensing question, whether relating specifically to theatres, music-halls, or other places of amusement, to be subject to central control by a Crown or Government authority. He suggested that the Local Government should appoint a Special Commission to draft some practical scheme by which the essentials of theatre safety might be obtained, and some workable measure for their control and administration be formulated.

"VENTILATION" was the topic selected by Professor A. Wynter Blyth, medical officer of health for Marylebone, as the title of his inaugural address as president of the London Medical Officers of Health, delivered at the Hotel Cecil on Friday evening. Dr. Wynter Blyth observed that ventilation was not the mere mingling and wafting of aerial mixtures, but the continuous replacement of air. It had come as a revelation and surprise to many that the *London Medical Pharmacopoeia* had the word "air" extracted as one physical appliance, neither singly nor collectively, was equal in the tubercle to bathing the lungs and skin in fresh air. The remarkably successful treatment by open air of consumptive maladies must suggest to them that, if air was a curative, it was also a preventative agent, and that abundance of pure air could be supplied to each unit of the population the death-roll from phthisis would be so significant as to render special sanatoria unnecessary. The problem to be solved was not the changing of air three times an hour in the spacious rooms of the well-to-do or in hospitals, but in the small apartments sanctioned by the Legislature—spaces of 400 and 300, or even 250 cubic feet—far, obviously, if the problem was solved

for the smaller it was also solved for the larger space. The wide distribution of electric energy permitted such mechanical appliances as rotating fans to be utilised by ordinary householders. Wherever there was an electric supply mechanical ventilation was cheap and practicable. He dealt, in conclusion, with local circulation, mechanical ventilation, and ventilation of sewers by means of fans.

The report of the Examinations Department of the City and Guilds of London Institute for the session 1900-1901 shows that during the past session, 2,222 classes were registered in different branches of technology and 165 in manual training. The number of students in attendance was 76,051. In technology 14,816 candidates were presented for examination, and in manual training 922. These numbers include those examined in India and the Colonies. For the past session the number of students entered on the Institute's forms was 3,639, as against 2,899 in the previous year, and the number of candidates was 1,394, as against 1,210. In the different branches of the building trades there was a general increase in the number of candidates, the chief exception being in plumbers' work, in which subject 1,333 candidates presented themselves for examination, as against 1,374 last year. It is satisfactory, however, to note that 3,340 students have received instruction in the classes registered by the Institute, as against 2,982 in the previous session. "Whilst attending the preliminary course," the report remarks, "the attention of students should be mainly directed to exercises in drawing and practical instruction in geometry, mathematics, and elementary science; and care should be taken, where a sufficient number of students are pursuing a course of teaching relating to any one trade, or group of allied trades, to make the drawing exercises and the experiments illustrating science lessons bear directly on the students' future occupation." Practical teaching in the trade workshop attached to the school is of less importance during the preliminary stage of the young workman's studies than later on, when he will have acquired sufficient skill in the use of tools to profit by advanced and specialised instruction."

A petition is about to be presented to the City Corporation, praying that body to use its influence to bring about the further postponement of the application of the Land Transfer Act to the City of London until a properly constituted inquiry has been held and concluded. The petitioners urge that the new system involves grave inconveniences, and largely increases the expense and delay incident to mortgages and purchases of property, without any corresponding advantage; and that it would be peculiarly unsuitable in its application to property in the City, and transactions connected therewith. It is further pointed out that the Act was passed by Parliament as an experimental measure only, and that, as under its provisions some 20,000 titles have been already registered in the country, ample materials exist for the suggested inquiry. The petition lies for signature at the office of Mr. J. S. Rubenstein, solicitor, 5, Raymond's Buildings, Strand, and also at the office of Mr. Robert T. Wrang, solicitor, 16, Devonshire-square, Bishopsgate.

MEETINGS FOR THE WEEK.

Monday.—Royal Institute of British Architects. Opening Address by the President, Mr. W. E. Kingston, 8 p.m.
 Edinburgh Architectural Association. Opening Soiree at the new house, 117, George-street, Edinburgh, 8 p.m.
 Tuesday.—Institution of Civil Engineers. Inaugural Address by the President, Charles Hawley, 8 p.m.

Wednesday.—Civil and Mechanical Engineers' Society.

Thursday.—Architectural Association. Discussion session. "The Finishing of a Dwelling-House," by W. E. Davis, 8 p.m.
 Glasgow Architectural Craftsman's Society. "Hard and Soft Timbers," by R. Stuart and D. S. Fringle, 8 p.m.

The new electricity works which have been erected for the electric-lighting committee of the Heywood Corporation at Hudd Hill were formally opened on Saturday afternoon.

The isolation hospital, Skipton, is being warmed and ventilated by means of Skipton's patent Manchester stove—one double-fronted and some single-fronted—with descending smoke-flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Trade News.

WAGES MOVEMENTS.

SWANSEA.—The Master Builders' Association have decided not to accept the suggestion that the mayor should act as a mediator in the dispute with the labourers. The masters state that they can obtain sufficient labour for their present requirements.

LATEST PRICES.

IRON, &c.			
	Per ton.	Per ton.	
Rolled-Iron Joists, Belgian	£3 0 0	to £3 10 0	
Rolled-Steel Joists, English	10 0 0	to 10 15 0	
Wrought-Iron Girders, English	10 0 0	to 10 15 0	
Bar Iron, good Staffs	6 15 0	to 8 10 0	
Do, Lowmoor, Flat, Round, or Square	3 0 0	to 30 0 0	
Do, Welsh	20 10 0	to 51 6 0	
Boiler Plates, Iron—			
South Staffs	10 0 0	to 10 0 0	
Best Sea-kill	12 0 0	to 12 0 0	
Angles 10s., Tees 25s. per ton extra.			
Builders' Hoop Iron, for bonding, &c., 66 lbs.			
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.			
Galvanised Corrugated Sheet Iron—	18 to 20.	No. 22 to 24.	
6ft. to 8ft. long, inclusive	Per ton.	Per ton.	
Gauge	£11 5 0	to £11 12 6	
Best ditto	11 15 0	to 12 5 0	
Cast-Iron Columns	Per ton.	Per ton.	
26 to 30	£6 10 0	to £8 10 0	
Cast-Iron Stanchions	6 10 0	to 8 10 0	
Rolled-Iron Fencing Wire	6 10 0	to 6 15 0	
Rolled-Steel Fencing Wire	6 10 0	to 6 15 0	
Cast-Iron Sash Weights	Galvanised.	8 0 0	to 8 5 0
Cut Clasp Nails, Sin. to 6in.	9 15 0	to 9 15 0	
Cut Floor Brads	9 10 0	to 9 10 0	
Wire Nails (Gals. and Bars)			
6 to 8	9 10	11 12	13 14 15 B.W.G.
8 to 9	9 9	9 9	11 10 12 13 14 15 per wt.
Cast-Iron Socket Pipes—			
Sin. diameter	£5 15 0	to £6 0 0	
4in. to 6in.	12 15 0	to 13 0 0	
Tin to 24in. (all sizes)	12 0 0	to 13 0 0	
[Contract with composition, 5d. per ton extra; turned and bored joints, 5d. per ton extra.]			
Pig Iron—	Per ton.		
No. 1, Lillishall	100 to 125. 6d.		
Hot Blast, ditto	65s. 0d. to 70s. 0d.		
Wrought-Iron Tubes and Fittings—Discount off Standard List (i.e.)		70 p. 0.	
Water-Tubes	62	to 63	
Steam-Tubes	60	to 61	
Galvanised Gas-Tubes	58	to 59	
Galvanised Water-Tubes	52	to 53	
Galvanised Steam-Tubes	47	to 48	
10wt. coils. 5wt. coils.	Per ton.	Per ton.	
Zinc, English (London mill)	£21 10 0	to £22 15 0	
Do, Vieille Montagne	25 0 0	to 25 10 0	
Sheet Lead, 5lb. per sq. ft. super.	12 6	to 12 12 6	
Wire Lead, in 10wt. pigs	12 0 0	to 12 0 0	
Lead Shot, in 28lb. bags	15 2 6	to 15 5 0	
Copper-Sheets, sheathing and rods	80 0 0	to 80 0 0	
Copper, British Cake and Ingot	71 0 0	to 71 10 0	
Tin, Straits	113 0 0	to 113 5 0	
Spelter, Silurian	116 0 0	to 116 10 0	
Spelter, Silesian	17 0 0	to 17 2 6	

TIMBER.

Oak, Burnham	per load	£10 0 0	to £17 0 0
" Bangkok	10 0 0	to 15 15 0	
Quebec Pine, yellow	13 7 6	to 4 15 0	
" Oak	10 0 0	to 2 0 0	
" Birch	3 15 0	to 6 0 0	
" Elm	2 0 0	to 6 0 0	
" Ash	2 0 0	to 6 0 0	
Duntic and Mamel Oak	2 10 0	to 4 10 0	
Wainesc, Rign p. log	2 5 0	to 3 15 0	
Luth, Duntic, P. i.	4 0 0	to 5 0 0	
Greenheart	7 15 0	to 8 0 0	
Box	7 0 0	to 15 0 0	
Pecunia, U.S.A.	0 9 0	to 2 0 0	
Mahogany, Cuba, per super foot lin. thick	0 4 0	to 0 8 0	
" Honduras	0 4 0	to 0 8 0	
" African	0 4 0	to 0 8 0	
Ceylon, Cuba	0 25 0	to 0 50 0	
" Honduras	0 30 0	to 0 50 0	
Walnut	0 10 0	to 0 15 0	
" Italian	0 10 3	to 0 15 0	
" American logs)	0 2 3	to 0 4 8	
Deals, per St. Petersburg Standard, 120—12ft. by 1 1/2 by 1 1/2in.			
Quebec, Pine, 1st	£22 0 0	to £29 5 0	
" 2nd	15 0 0	to 18 5 0	
" 3rd	11 0 0	to 14 5 0	
Canada Spruce, 1st	12 0 0	to 11 5 0	
" 2nd and 3rd	8 15 0	to 10 0 0	
New Brunswick Rign	8 0 0	to 9 0 0	
St. Petersburg	10 0 0	to 17 0 0	
Finland	9 0 0	to 11 0 0	
White Sea	11 5 0	to 20 0 0	
Baltics, all sorts	13 5 0	to 15 0 0	

Flooring Boards, per square of lin. :—			
1st prepared	£2 11 6	to	£2 18 0
2nd ditto	0 10 6	to	0 11 0
Other qualities	0 5 6	to	0 12 0
Staves, per standard M :—			
U.S. pipe	£37 10 0	to	£45 0 0
Memel, or pipe	220 0 0	to	230 0 0
Memel, brack	190 0 0	to	200 0 0

STONE.

Darley Dale in blocks	per foot cube	50 2 1/2
Red Mansfield ditto	"	0 2 1/2
Hard York ditto	"	0 2 1/2
Dittos in stone, both sides, landing	"	0 2 1/2
random sizes	per foot sup.	0 2 8
Ditto ditto sin. slabs, sawn two sides, random	"	0 1 3
Hopton-Wood (Hard Bed) in blocks, per foot cube	"	0 2 8
Ditto ditto 6in. ditto, sawn both sides, landing, random sizes	per foot sup.	0 2 6
Ditto ditto sin. ditto ditto	"	0 1 2 1/2
Portland, White Bed	per foot cube	0 2 0
Ditto Base Bed	"	0 2 1/2

• All F.O.R. London.

OILS.

Linseed	per tun	£32 0 0	to £32 5 0
Rapeseed, English pale	..	27 5 0	27 10 0
Do, brown	..	25 15 0	26 0 0
Cottonseed, refined	..	22 5 0	22 15 0
Olive, Spanish	..	38 0 0	40 0 0
Seal, pale	..	26 15 0	27 0 0
Coconut, Cochín	..	31 0 0	31 0 0
Do, Ceylon	..	28 10 0	29 0 0
Palm, Lagos	..	26 0 0	26 5 0
Oleine	..	1 0 0	1 0 0
Lubricating U.S.	per gal.	0 7 0	0 8 0
Petroleum, refined	..	0 5 1/2	0 5 1/2
Tar, Stockholm	per barrel	1 0 0	1 0 0
Do; Arcebach	..	0 19 6	1 0 0
Turpentine, American	per tun	37 0 0	37 5 0

To Manufacturers and Others.—A Literary Agency of nearly forty years' experience, and having since with every branch of the building trade, offers its assistance for an equitable fee in the preparation of technical works dealing with architectural subjects and kindred subjects. The agency's trade relations in these days is little heralded, but the same influence, now, suggestions, and kindred, into the form of technical works contains general information, and its publication can sometimes be regarded as of considerable importance from a technical point only.—GILFILLAN & CO., Building News Office, Clement's House, Clement's Inn passage, Strand, W.C.

CHIPS.

The States of Jersey have perpetuated the memory of the late Lieut.-Colonel P. W. A. Le Gallais, who was killed at Bothaville, South Africa, some 11 months ago, by erecting a memorial in St. Helier's Parish Church. The work has been executed by Messrs. H. H. Hens and Son, of Caudebec, and takes the form of a mural tablet of alabaster resting on a background of white marble. It has been placed over the north porch in the nave.

The new Municipal School of Science, Art, and Technical Instruction, instituted by the Coleraine Urban Council Committee, under the scheme approved of by the Department of Agriculture and Technical Instruction, was opened in Coleraine on October 18.

The Lowestoft Town Council have adopted the first portion of the scheme of sea defences devised by Mr. Douglas, C.E., and have accepted the tender of Messrs. Facey and Co. for carrying out the southern half of the wall and groynes on the North Beach, the northern section being left over for the present.

Few objects of archaeological interest have been unearthed during the extensive excavations which have been made in the development of the Finsbury estate, London Wall. Beyond a few Medieval knives, fragments of pottery, and a few Roman coins, nothing valuable has been discovered. The coins consist of two specimens of Antoninus Pius, who died A.D. 161; one of Trajan, who reigned about the same time; one of Hadrian, who was assassinated A.D. 217; and a Vespasian, the date of which would be between the years A.D. 70 and 79. These coins have been placed in the Guildhall Museum.

Messrs. Boyes and Co., Ltd., the Holman Warehouse, Scarborough, have had a large illuminated clock erected on their new premises, showing the time upon four external dials. The work has been carried out by Messrs. Potts and Sons, clock manufacturers, of York street, Leeds, and Newnham-on-Tyne. They are now erecting a new clock at the parish church, Sutton-in-Craven, near Kesteven.

At the Westminster Guildhall, on Tuesday and Wednesday, Mr. Under-Sheriff Troutbeck and a Special Jury heard a claim for compensation against the London County Council. The claimants were Messrs. Clive and Co., booksellers and publishers, and the claim, which was for £1,000, arose out of the County Council's scheme for construction of a new avenue from County Court House, in consequence of which Messrs. Clive were forced to remove from their premises at 13, Holywell-street. Trade witnesses and surveyors were examined, and concluding that the council's claim was warranted £2,500. Judgment was given accordingly.

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MATERIALS AND APPLIANCES.

SELECTION forms an important side in the modern practitioner's work, for he has to decide as to various questions and matters relating to building. In the choice of materials and appliances he has to display both knowledge and judgment if he would escape the charge of incompetence. The architect has no time or sufficient technical knowledge to design special kinds of construction—like fireproof floors, heating or ventilating arrangements for his buildings—and he has therefore to avail himself of a variety of manufactures and inventions of others, which are really becoming too numerous to examine with care. To consider only two departments or trades allied to building—sanitary or hygienic and mechanical invention, under which latter description may be included most of the fittings and appliances that go under the name of "builders' ironmongery"—would be a large task. All that we can do is to try and tabulate or classify those things that the architect is in the habit of specifying, and endeavour to discover some general principle that may assist us in arriving at a fair estimate of their merit. This is no easy matter, for however anxious an architect may be to keep pace with modern improvement, he is very reluctant to give up certain things that he has found to be good and reliable—such as certain bricks and sanitary fittings and particular fastenings and appliances. Occasionally a revision is necessary to be made—that is, of old things that have given place to new, or that have become obsolete.

At intervals of time this process of rejection is repeated: materials and appliances fall out and others take their place, according to the law of the "survival of the fittest." A good lock or fastening forces itself upon the architect's attention when he first sees it; but there are other things which are more slowly apprehended. Probably it is some patented material for partitions or lining walls, a sanitary fitting, a new paint, or a floor system. Each of these things has to be apprehended or investigated by different methods. If it is a new cement or patent stone, or a floor, we naturally prefer to wait till we read of some well-attested experiments or tests, or some valued opinion, before we use it; the effects of the atmosphere and certain solvent agents like acids have to be considered; we are not sure how a new paint or fabric will last under the action of moisture or heat. If it is a sanitary fitting, we like to have an assurance of its action for some time, to see how it operates—whether it will soon get out of order, &c.; but in the case of many appliances and inventions, like door or window fastenings, weather-resisting casements, a weather bar, or a semi-prism light, for example, when the evidence of our senses can be directly appealed to, we at once give our assent, or not. These are things that immediately appeal to our common sense; directly we see them we approve them, and they are mainly mechanical in operation, and do not require experiment or experience to justify their claim to superiority or the reverse. To this class belong all such things as weather-jointed tiles, simple modes of bonding bricks, simple-acting locks and fastenings, such as means of closing fanlights, skylights, wash-down closets, and even such things as radiators or the application of a well-recognized principle, as the Kern burner to gas-

stove- or hot-water heaters, an economical fire-resisting floor, or improved glass roofing.

With the multiplicity of inventions and appliances in the market, it becomes absolutely necessary, however, for the architect to examine for himself the various claims made by tradesmen and manufacturers. Our leading and experienced men have no difficulty in selecting the best in the market; but the younger and less experienced are not in the same favourable position, and it is for these we now mainly make a few suggestions that may be found of service. A great many architects necessarily rely on recommendation and advertisement only. They receive by every post circulars and prospectuses from various firms describing their goods, drawing attention to their advantages, their economy and cheapness, and the defects of other materials and appliances. Many of these firms send lists of the buildings and architects in which, or by whom, the said article has been used. These trade circulars are oftenattering, sometimes mere "puffs," but making allowance for a small percentage of puffs, the young practitioner can fairly decide for himself which of the goods are the most likely to meet his requirements or appear to deserve a trial. To obtain evidence of the merits of any particular manufacture personal inspection is necessary. There are others in the profession who do not definitely specify the goods of any individual firm, but leave it open to the after-selection or approval of themselves or their clients—a method of contracting that is not always satisfactory. The contractor under this arrangement takes advantage of the indefinite, and selects his own materials and manufactures; goods are ordered of an inferior quality; or the client knows nothing of the most approved manufacture, and selects fittings or appliances that are distinctly inferior—perhaps those of a showy design. For instance, the owner goes to a firm of ironmongers, and selects his own stoves and grates that may be inferior in construction and design, or he chooses his door furniture, his gas or electric-light fittings, his wall-papers and decoration. The architect may acquiesce, and the result of the arrangement is that the goods are quite out of harmony with the design of the building—everybody is dissatisfied, and the manufacturers of better things have a right to complain. Of course, the architect is blamed: he ought to have specified grates and fittings that were in keeping, or of improved kind; his complacent desire to consult the taste of his employer recoils on his own head. If he is employed to design the building, he should be the only competent person to select what pertains to the building in the form of fittings and decoration. If certain goods are left for his approval, he should exercise the right of selection, and the only way to do this is to provide an amount to be expended by the architect, or to give prime-cost amounts, and to name the firm or manufacturer. In ironmongery, especially, the greatest care is required in seeing that good mortise and rimlocks, door furniture, casements and fasteners, &c., are used, by describing the items, and giving the numbers in the manufacturers' catalogues. Inattention to these details gives the contractor an opportunity to use inferior articles, and to substitute other patterns than those intended.

There are certain criteria that may be usefully applied in selecting materials, appliances, and methods. These are generally (1) fitness or suitability, (2) durability, (3) good taste. And it is necessary to bear in mind some scientific classification of the goods, so as to apply the proper tests. The test that is applicable to any material like an artificial stone or cement would, of course, be very different to that to be used in the choice of a fireproof floor or a metal casement. The conditions are more varied and complex in one case than the other. Take cement for instance: before we can justify

its use, certain experimental tests must be put into operation. We can gauge a little of the cement with water, mix thoroughly into a stiff paste, and leave it exposed to be examined from time to time. If cracking occurs, the cement is rejected; or we can mould the cement mixture into briquettes, heavily press it, and then place it under water. If unsound, cracking will be seen in twenty-four hours. Tensile strength is, of course, one of the best tests; but these tests require time, experimental research, and chemical knowledge. How many in the profession are capable, or have sufficient chemical or technical knowledge, to test the chemical qualities of mortars or cements, or any new material of this sort? Certain constituents of, say, limestone, have to be looked for, such as moisture, silica, oxide of iron, alumina, lime, &c.; and to do this, particular processes are necessary—so many grammes have to be taken for each of them, and each has to be determined. Not every practitioner is able to undertake the mechanical test of Portland cement as ordinarily adopted with regard to standards of fitness and tensile strength, or the detection of adulterants, such as unburnt gypsum and slag. Artificial stones also require considerable experience, or properly conducted tests to reveal their qualities. In the absence of this experience, the opinion of scientific journals or expert assistance should be obtained. Those materials or contrivances that can only be tested by experiment or by trial more or less protracted, form a class of goods quite distinct from appliances and inventions that are chiefly mechanical in their construction and use, and for this very reason it is more difficult to appraise them. A patent cement or artificial stone, or fireproof material requires time and experience to test its qualities; but the simple fastening or latch can be decided upon without hesitation. Between these extremes come a number of complex inventions, as traps or ventilators, the merits of which depend upon conditions which can only be estimated after a series of tests have been made. We allude to such inventions as sanitary systems. The action of traps to insure a good water seal, and to prevent siphonage, methods for disconnecting houses from sewers, ventilating systems and appliances, such as cowls, and which latter, as we have seen, cannot be so easily connoised or their results determined as some imagine—systems and appliances for heating, hot water appliances, and the like. All these systems and appliances or inventions depend not merely on mechanical but pneumatic, hydraulic, and other physical laws, and to examine or test them it is necessary to do so under precisely the same conditions under which they will be used in a building. We know how impossible it is to do so with any assurance, as one factor, such as the pressure of the atmosphere, or temperature, may vitiate the result. The fire-proof floor, or any method of construction, cannot immediately approve itself: the architect waits for experimental tests, or the experience of others; how it has behaved when subjected to a fire. So that many building materials, appliances, and inventions must be judged according to a certain standard, and varying conditions which the architect ought to comprehend so as to be able to apply the right mode of test. For example, a very ingenious arrangement of concrete and steel may not be the most fire-resisting for a partition or roof if the chief condition of resistance is not present, or if the materials are combined in such a way as will lead to unequal stresses. The architect, in his selection of these forms of construction, is liable to be drawn away by points that are immaterial, such as the sectional forms of iron or steel; or if it is a heating apparatus, he is likely in selecting a special apparatus to overlook the peculiar conditions of the building—for instance, the importance of warming

the use of the apartment. Hot coils or radiators are excellent for such purposes where radiant heat is desired; but they only heat a side of a person, and we cannot warm air by diffusing warmth through it equally except by having recourse to hot water, hot air, or steam. In rooms with large windows their heating effect is so great that radiant heaters would be almost useless, and these conditions must be taken into account in selecting a system or special apparatus. It is for the architect to exercise his judgment, not to call in a firm of makers, who will, of course recommend their own system, admirable for some purposes, but not suitable to all circumstances.

In a building where a high temperature has to be maintained, steam or a high-pressure system of small tubes, with the boilers formed of coils, is the only method; but in ordinary buildings the low-pressure, requiring large pipes, are desirable. Where heated air has to be distributed or diffused we must depend on warm-air stoves or stoves, such as the patent Manchester grate or grate, made in various forms. In every instance the special conditions must be complied with, which the inventor or manufacturer had in view.

So in ventilating appliances, no one can wish for better ventilators than the "latest air-pump ventilator"; but for every set of conditions the architect must be sure to select the type best adapted, as they are made in several forms, or place himself in the hands of the firm. It is not a good plan to leave these matters to the contractor. A system of glass roofing can only be based on some real experience, such as we have in the "Inevitable" and other types. As to the inventions and building appliances that are chiefly mechanical in their operation, the architect is less open to doubt or difficulty in their choice. A mechanical or hydraulic lift, a water-waste preventer, a lock, a casement fastener are all of this kind. If he knows their action or has seen them, he is practically acquainted with them, the chief difficulty being to keep oneself posted with the latest developments or modifications—not an easy matter in those days, when so many costly illustrated catalogues appear frequently from the Press. These are frequently worth careful study, and often contain much valuable information and statistical bearing on the subject—in fact, every facility is given, by aid of exquisite engravings, to enable the architect to make a selection. When, as we say, the appliance is a matter that can only be tested by a trial or some experience, as in the case of a system of lead-glazing, the pictorial assistance may be the safest or the surest; but in a very large number of mechanical fittings and appliances the catalogue illustration may give all that is desired. Certain kinds of artistic productions, as relief decoration in plaster and other material, parquetry floors, fence decoration and wall-papers, electric and gas fittings, and a host of other things, of course, come under different conditions than those mentioned, as design and good taste become important elements or criteria in the decision.

MONUMENTAL DESIGN.

THE association of architecture and sculpture is not a condition of art that has been in favour in this country, and to this reason we must assign the poverty of our streets and squares compared with those of other countries. A copy of a triumphal archway has been erected here, an equestrian group or statue there; but without the least connection with or support from other works. The statues of our public men are few and unsatisfactory. The eminent authority on sculpture has said, "It is almost impossible to render interesting or attractive a portrait statue in modern dress when placed

on an open space—out-of-doors and with no near surroundings. But to place the same statue by a building, either on a pedestal in character with the architecture, or in a niche, and the monument will be then in place." All our modern out-of-door attempts at sculpture, as an isolated art, have suffered from this want of appropriate surroundings. Few of our London statues look well in their isolated positions; our sculptors try to make their work attractive in these circumstances by making certain conventions, such as giving their statues a classical garb, trying to render the features less individual and suggestive of the original. But the statues were placed in niches or were backed by a screen of columns, and surrounded by architectural accessories, the sculptor would not have to resort to this conventional mode of treatment; he could make them more human and individual in expression. These are considerations that have a bearing on any memorial or work of sculpture to be raised in our towns. It should have a setting of architecture or of architectural accessories, or even a background of foliage. The grouping of architectural and sculptural work has been essayed in the designs for the late Queen's Memorial with a main processional road leading from Buckingham Palace to Trafalgar-square, which offered a good opportunity. The terminal portions of this vista presented a splendid chance for something dignified and stately. The inclosure opposite the Palace, which has been reserved for the Memorial, suggests an architectural arrangement that will harmonise with the facade and give emphasis to it and the sculpture, and the competitors could not devise anything more appropriate than a colonnade screen, either of semicircular or rectangular shape. These forms have been adopted by nearly all the competitors, but only three of the designs show a colonnaded screen with loggia worthy of a monumental scheme. Mr. T. G. Jackson's idea is a well-designed rectangular arrangement, with re-entering angles joining the Mall, adorned by airy pavilions crowned by sculptures and obelisks. The accepted design of Mr. Aston Webb, and that by Mr. Ernest George both adopt the same class of screen, though the inclosed plan in the last scheme is oblong, with a curved or semi-elliptical-shaped entrance to the main avenue—a handsome arrangement of domical pavilions. In the other designs, the Monument to the Queen is made the dominating feature or keynote of the whole scheme, and therefore Mr. Brock's memorial and its surrounding balustrade and statuary occupy an isolated position, between the circular driveway and the main avenue. Sir Thomas Drew's design, this isolation is more noticeable, from the absence of a surrounding screen of any sort, though the Palace has been recast and made more imposing. As we gave a full description and illustration of the accepted design last week, and now illustrate the other proposals, it is unnecessary to dwell here on the features of the designs; we rather refer to their embodiment of the principles of landscape architecture. One of the ideas has been to make the central group dominate the arrangement and subordinate to the sculpture and the facade of the palace all other accessories of the main avenue; the other idea is to introduce architectural adjuncts, so as to form a connecting link as it were between them and the park. The first plan appears to us to dissociate rather harshly the architectonic and the landscape elements—to separate them, and to make the memorial the main feature, but isolated from its surroundings. It is perhaps the traditional English taste for having an object isolated, but it lacks the harmony of the other idea, and we venture to think it is scarcely in accord with the principles of monumental planning, or what we may call architectural landscape. And the same idea

of combining art with landscape ought to be maintained along the main avenue by an architectonic treatment, as shown in Mr. Aston Webb's scheme, where at intervals a series of arches or canopied niches are provided for appropriate or emblematic statuary. By these features the Park and avenue of trees is pleasingly broken, as well as by the main cross entrances to Clarence and Marlborough Gates and Waterloo Place, at which latter point, in connection with the flight of steps from the Duke of York Column, an octagonal arrangement of groups of sculpture and pavilions is suggested. The embellishment of the Mall, the main avenue, for us, takes it an important part of any general scheme.

It would be incomplete and unsatisfactory to see the architectural part of the design finished abruptly at the Palace end of the Mall; and yet two designs appear to make little attempt to improve the avenue, except to make an archway at the Spring-gardens end. No doubt, the authors considered the improbability of ever completing throughout the scheme; but this is no reason why the vista and the Trafalgar-square entrance should not be considered in the general plan. The main entrance from the Square is a point that ought to be emphasised, either by the erection of a grand archway or by some architectural approach. Mr. Webb's proposal is that the proper position would be between Drummond's Bank and the new building, where it would be visible to all from Charing-cross. Unfortunately, the axes of the Mall and that of the West Strand do not align; but this difficulty is well obviated by a circus, as proposed in the accepted design, or by other means of concealing the change of direction. The value of aligning the new Avenue with the West Strand is obvious. One of the designs actually proposes blocks of new offices at this juncture, which makes the deflection of axis more apparent.

The idea of embellishing the front of Buckingham Palace by a "grand place" in connection with the Mall is no new idea; but the opportunity has not occurred till now of realising the project. Our readers will be able, from the views and plans we give, to estimate the degree of success of our architects. We regret the field of choice was not larger; but the designs on view show talent. Mr. Webb's conception has been to inclose the Memorial with a garden, and to give it the quiet and associations necessary for a restful contemplation of the Memorial itself, as the centre of the scheme to which the various approaches contribute. The other authors appear to have thought less of the attitude necessary for giving effect to the Memorial and garden, as no one except Mr. Webb has proposed a road skirting the inclosed garden. At the Trafalgar-square end the circular inclosure, with its surrounding road and entrance into the square, cleverly disguises the divergence of axes—a certainly more satisfactory arrangement than any of the other designs show. The schemes put forward by Dr. Rowland Anderson and Sir Thomas Drew exhibit the Memorial as a feature opposite the Palace, as forming the termination of the main road of the Mall—not separated, as in the accepted design, by any colonnade screen; thereby making Mr. Brock's Memorial an integral part of the public vista to which it forms the terminal object. Both plans are similar in the treatment of the Memorial as an isolated centre inclosed by the surrounding roadway. In a less degree the plans of Mr. Jackson and Mr. Ernest George conform to this treatment, but they are much less architectural effective in both designs for the inclosure of the Mall. At the other end of the Avenue by a triumphal arch at the Duke of York's column, the other by a classical gateway at the entrance to Spring-gardens. The designs of Dr. R. Anderson and Sir T. Drew also show an archway at this end.

Few opportunities have been given to the profession to combine landscape with architecture. The rebuilding of the City after the Great Fire presented a grand opportunity; but it was not taken advantage of. Later the development of some of the western suburbs of the Metropolis afforded the architect the occasion of an exhibition of his skill; and Nash, Blore, and Cubitt might have done something to render the town monumental. Nash indeed had a good chance in the design of Regent-street, but the taste of the day was not quite ripe enough. The cities of Bath and Edinburgh are instances of towns where the modern architect has had a free hand. Wood did much to embellish Bath with streets and buildings, and in Edinburgh we can trace the hands of Classicists of the Georgian epoch—as in Princes-street and surrounding neighbourhood, presenting a very picturesque contrast between the old Medieval and the new parts of the town, as anyone knows who passes from High-street into Princes-street. The newer parts of the Metropolis offered a grand opening. The rebuilding of Bloomsbury, Regent's Park, and other parts of London presented large fields for design of streets on a noble scale. There is little that can be called monumental, Oxford-street, Piccadilly, Constitution Hill, Hyde Park Corner, and the Mall might have been laid out in a style worthy of the situation; those thoroughfares like Piccadilly and Park-lane skirting the parks gave splendid opportunities for displaying architectural and sculptural accompaniments; but the authorities intrusted with the laying-out of the approaches appear to have had no ambition to emulate the example of other countries, or to do more than to erect poor adaptations of the architecture of the past as an entrance to Buckingham Palace Gardens and to the equestrian statue of the Duke of Wellington—monuments that have been justly censured. All these attempts at monumental erections display the same piecemeal plan of designing arches or sculptural groups in isolated positions, without any connection with other structures or surrounding accompaniments. Complete schemes have always been in abeyance.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE inaugural meeting for the present session of the Institute of Architects was held on Monday night, the President, Mr. William Emerson, occupying the chair.

Mr. ALEXANDER GRAHAM, hon. secretary, said he regretted to announce the decease of several well-known members, including among the Fellows Messrs. James Bouverie, past president, William Larnar Sugden, of Leeds, Robert Isaac Bennett, of Manchester, Yeoville Thomason, of Birmingham; John Littlewood, of Manchester; and John Macdonald, and among the Associates Herbert Richard Lloyd, of Birmingham. The lives and works of each of these Mr. Graham made brief and appreciative references, and he spoke especially on the career of Mr. Brooks, whom he described as a familiar figure at the meetings, and one of the last survivors of the school of Pugin. Mr. Brooks, he added, never swerved during a long career from the principles of that school; he showed great excellence and skill in church planning. The lines of his work were marked by much simplicity, and evolved in an English phase of Early Gothic, and were without characterised by a restraint not often seen in like works by other architects. Mr. Graham added that since they last met the American Institute of Architects had unanimously elected their President as an honorary member.

Mr. Emerson would, at an early date, attend one of the meetings of their sister institute as a representative of British art.

The President, who was received with hearty cheering, said he had pleasant recollections of his visit to Chicago as a judge in architecture at the Exhibition. The architects of the United States were solving the problems of modern civilisation in an original manner, and they were careful to

send their students over to Europe to study both Gothic and Classic work. Mr. Graham had referred to the great losses they had sustained by death recently, and he might mention that the late Mr. Arthur Cates, whose decease they all deplored, had bequeathed a sum of £1,500 to the Institute.

Mr. GRAHAM added that Mr. Cates had also left the Institute a collection of 215 valuable and beautifully-bound books, and Mrs. Cates had visited the library and had selected a site on which she was proposing to erect a handsome house for housing them. Where these works duplicated those already possessed by the Institute, Mr. Cates's copies would be added to the reference department, those at present in the library being added to the loan department. He moved a vote of thanks to Mrs. Cates.

This was seconded by Mr. R. PHENE SPIERS, and agreed to.

A vote of thanks was also passed, on the motion of Mr. JOHN SLATER, to all who assisted in rendering the recent visit of the Institute to Glasgow a success, including the Corporation and University, the Institute of Architects, and the Arts and Imperial Union Clubs.

The President then delivered his

OPENING ADDRESS.

in which he observed he should confine his attention to current points of importance and interest. Our numbers, the President remarked, showed a steady increase, and each year more candidates present themselves for examination than on previous occasions. We have, in fact, some 1,700 actual members of the Institute, or over 3,000 members, counting those of societies in alliance with us. There are also some 1,500 people who are more than nominal members, which is some proof of the value set on the Institute examinations and the trend towards improvement in the education of architects. This speaks very well for our increasing prosperity, so far as it can be told by figures. Unfortunately, though our numbers steadily increase, our funds are steadily dwindling. We have 24 members, for since this time last year we have lost twenty-one Fellows and five Associates. It is sad to find that amongst this number have been some of the greatest and most honoured names. The roll includes Barry, Brooks, Brydon, Burnet, Cates, and Young, and many of the number were carried off while in the prime of manhood and busy in harness—two of them just as they had achieved the honour of being appointed to design and carry out two of our greatest public buildings. That the influence of the Institute is growing and not waning is shown by the number of instances in which it continues to be appealed to on architectural questions by public and other bodies, both in the Metropolis and provinces, and the number of congresses and other meetings to which we are asked to send representatives and invited to express our views. If the Institute would only let its voice be heard on important points in respect to architectural questions as they arise, whether they be Metropolitan improvements or other important schemes, we should, and ought, gradually to become the guiding spirit in such matters. While touching on this point

METROPOLITAN IMPROVEMENTS

and large architectural questions, I suggested last year the advisability of some more organised system of control over design. Whether it were by a Ministry of Public Works, as proposed by me, or by a Royal Commission, as has been suggested since both by the President of the Royal Academy and Lord Wemyss, is of little matter so long as the responsibilities were fixed. In America, at Washington, the same suggestion is being urged on the Government. It has been stated that the work of Piccadilly was only a first stage improvement scheme for that particular approach to the City from Kensington, in which the taking down and rebuilding of Walsingham House would afford an opportunity for a move in that direction. Whether this is so I have no knowledge; but the question I would ask is, Why deal with the work of Piccadilly as a single improvement scheme for that particular approach to the City from Kensington, in which the taking down and rebuilding of Walsingham House would afford an opportunity for a move in that direction. Whether this is so I have no knowledge; but the question I would ask is, Why deal with the work of Piccadilly as a single improvement scheme for that particular approach to the City from Kensington, in which the taking down and rebuilding of Walsingham House would afford an opportunity for a move in that direction. Whether this is so I have no knowledge; but the question I would ask is, Why deal with the work of Piccadilly as a single improvement scheme for that particular approach to the City from Kensington, in which the taking down and rebuilding of Walsingham House would afford an opportunity for a move in that direction.

but it would be a gradual work, and, though slowly, London would at length be rebuilt on a properly considered plan, instead of an improvement here or a widening there being effected without relation to any well-considered inclusive scheme, covering the whole problem. The consideration of the question of the insanitary effect of large areas overcrowded by a dense population in flats, the shutting-out of sun and air, arcades over footpaths, railway works in the Metropolis, sites for workmen's dwellings, &c.—these are a few of the many questions entering into any scheme of improvement, as well as the outgrowth of the Metropolitan Improvement Bill, and they should be dealt with by the Ministry or Commission to which I have referred. It is time that Parliament took some step in the direction indicated.

THE ASSESSOR IN COMPETITIONS.

A great deal has been written of late in some of the journals on the subject of assessors in competitions, and evidently without knowledge of the truth of the matter or troubling to ascertain it. The suggestion has been that the blame of the dissatisfaction so constantly arising as to awards lies at the door of the President or Council of the Institute for not having exercised sufficient care in the selection of assessors. I have therefore had a list made of the competitions held since July, 1899, up to September last, with the assessors' names and the results—that is to say, as to whether there has been any expression of dissatisfaction in regard to their awards. There have been during this period 97 competitions held in all parts of the country and Metropolis. Out of this number there were 73 in which the authorities chose their own assessors, or, at any rate, did not apply to the Institute to name one. Out of these 73 the assessors' awards were set aside and dissatisfaction was expressed in 12 cases, or, practically, one in every six competitions. In the remaining 24 the President of the Royal Institute of British Architects, or the Council in a few instances, nominated the assessors, and in not a single instance was the award of these assessors set aside; nor can I find that any expression of dissatisfaction arose at their awards. There was only one case in these 24 where an applicant was refused the award, and that was solely on the part of one person out of 62 competitors for the same subject, because a certain alteration had been made in the conditions by the assessor, who was appointed a week or two after those conditions had been issued by the authorities. As it apparently made no difference to 61 out of 62 competitors, it could not have been of serious importance, and there was no dissatisfaction expressed at the assessor's award. This proves how ready some even of our own members are to blame either the management or the officials of the Institute when they do not even know the facts about which they are complaining or talking. A little more loyalty and real honest endeavour to serve the ends for which we are all supposed to be united and working would be more to the point, and assist materially the work of the Institute for the good of our art and the profession at large. This examination of the result of the enormous number of competitions of the couple of years is enough to deter most men in the profession from taking part in them; but if not—and we choose to have it so—we should bear in mind that in every competition the larger proportion of the competitors must naturally feel disappointed, as there can only be one winner; and if a man does not care to take this risk, he should not compete. One can only endeavour to nominate the right man as assessor; but even his is hardly likely, however level-headed, careful, and just in his perceptions he may be, to please everyone. Anyhow, if the public continue to lay the burden of competition on the profession, and we prefer to bear the burden of the public's criticism, at least let us be fair amongst ourselves, and let us that nothing shall upset the principle we have long ago laid down—that when a duly-qualified assessor has been appointed, and has selected a particular design, the author of that design shall, unless there be some very special reason to the contrary, be employed to carry out the design. If the competitors are simply playing into the hands of an unscrupulous public, prepared to take every advantage of our time, talents, and money. Even should the assessor happen to make an award that does not commend itself to all, it will certainly be better for the profession in the long run that the award be upheld than that each dissatisfied competitor should endeavour to upset it. Our only safeguard is loyalty to uphold this principle.

cious and rare materials might be infinitely more satisfactory and in better taste than some of the large and elaborate altar-pieces of soft stone and inferior sculpture which would certainly have been erected in many of our churches in late years. One objection, no doubt, that would be raised to such an arrangement would be that, by the present plan, we are supposed by degrees to arrive at the holiest of all at the altar, which, therefore, is removed furthest from the vulgar; but any adverse arguments could be raised; but, all the same, the question would still remain of the vital necessity for fervent worshippers being able to see and hear and join in all parts of Divine worship. I would commend the point for consideration to any of you who may be likely to have the chance of a large church or churches, and to modern times. Gentlemen, this is the last time I shall have the honour of addressing you on the first day of a new session, and I can only conclude by once again saying how greatly I feel the honour you have conferred on me, by again electing me as President. I assure you I shall do my best to do all in my power to the best of my ability, to do all I can to further the interests of our noble art, to extend the influence of this Institute, and to uphold in the highest sense, as far as I am able, the dignity of our profession. To these ends the Council are ever ready to give their unqualified aid, and I only ask you all to lend your joint with us in our endeavours.

Mr. J. MACVIEAR ANDERSON, Past-President, in proposing a vote of thanks to the President for his address, urged the advisability of accumulating the surplus funds of the Institute, and not spending them too hastily. They had all and with regret of the serious illness from which Mr. Alfred Vaughan, who had been elected, was trusted that that eminent architect would be restored to some measure of health, and in any case would enjoy, in his enforced retirement, that rest and peace to which his active life had so fully entitled him. As to the well-known subject of competitions, the President had referred to the "anarchy" but the Council were not to be rendered unscrupulous by the eagerness with which architects responded to every invitation. If architects would refrain from competing, this competition question would settle itself. The difficulties as to the Liverpool Cathedral competition ought not to have arisen, for the committee ought in fairness to have given the commission to their President, who, according to the assessor, the late Mr. Ewan Christian, produced the best design in the competition of fifteen years ago. It was true the site had been altered, but the design could easily have been adjusted to suit the fresh position. The President had devoted much of his address to modern church planning. There could be no doubt the Medieval plan of church was not suited to present-day work.

Mr. G. H. FELLOWES FYENE seconded the motion, and observed that their President had acted unjustly, unfairly, and dishonestly towards the Liverpool Cathedral Committee. If their President had been invited to prepare fresh plans based on his original design here would have been no jealousy or ill-feeling, but all architects would have regarded it as an compliment to the profession. The subject of church planning was one of very great interest, and he wished that Mr. Fellowes FYENE had spoken a little too strongly as to the Liverpool Cathedral. The members of the present committee were not all the same persons who constituted the committee of fifteen years ago, and they were justified in seeking to get a better design than the one first sent in, and if they did he would heartily congratulate them. He was sure he must confess to a little disappointment, though he had hardly expected the project to be carried out in his time.

Mr. W. F. WIMM has been elected borough surveyor of Helston.

THE ARCHITECTURAL ASSOCIATION.

THE second ordinary meeting for the present session of the Association was held on Friday evening at 9, Conduit-street, W., the President, Mr. W. H. Smith-Smith, F.R.I.B.A., occupying the chair. The following 51 new members were elected:—Messrs. J. A. Bailey, J. H. Bailey, J. H. Gott, A. G. Parker, H. L. Sanson, B. B. Hooper, W. J. Parker, J. H. Bellragg, J. C. Calder, J. C. Corbett, J. H. Crabtree, J. J. Crowe, Jun., L. H. Harrington, A. J. Healey, D. S. Jennings, H. P. Pierce, L. Roberts, S. C. Stock, E. P. Stowell, J. W. Statham, J. Thorne, E. F. Webb, H. D. Aubrey, A. B. Botterill, R. B. Sinclair, E. Chaplin, R. B. Curwen, M. E. D. Dixon, J. V. Gibberd, Norman Hall, C. R. G. Harrison, C. McEwen, H. Kemp, C. W. Kilner, D. M. O'Connor, A. E. S. Payne, P. Phipps, G. A. Potts, F. G. Russell, S. M. Spoor, E. G. Stevenson, R. W. Suttle, W. J. Tomlinson, W. J. Travers, C. F. Ward, R. H. Willson, and B. H. Sutton. Mr. BALFOUR, hon. sec., proposed a vote of thanks to the Rotary Photographic Co. for donations of photographs to the Day School. The President announced a vacancy on the committee owing to Mr. Arthur T. Bolton's resignation prior to his appointment as master of the Day School. The committee had nominated Mr. R. H. Weymouth to the vacancy, and his election would be formally proposed at the next meeting.

EARLY AND MEDIEVAL CAMBRIDGE.

A paper on this subject, illustrated by drawings by the lecturer, was read by Mr. ALEXANDER WOOD, M.A., F.S.A., who dealt with his topic mainly from an antiquarian point of view. The dykes and walls formed as defences by the East Angles, near the town against the Mercian and other neighbours, the Mercians, were described in detail, as were the chain of hillside forts which overlooked the district of the two Roman roads that intersected at this point—that from the modern Chester to Colchester, and that from Rochester to Bath. The mound known as the Cornhill is probably a Roman work undertaken in 874 as a protection from the Danes. Coming down to the 13th century, Mr. Wood showed that the so-called School of Pythagoras, which formerly stood near the Castle, was nothing more than a grange. Of this two-storied farmhouse a wall remains exist. Having dealt with the Medieval College, two of which united to form Corpus Christi College, and with the antipathy of the townsfolk to all guilds, the lecturer treated in considerable detail upon

THE CHURCHES OF CAMBRIDGE.

and especially those connected with the colleges. The oldest church and building in the town is St. Benedict's, or St. Bennet's, Church. The body of the church was restored by Mr. R. Brandon, and exhibits few traces of its remote antiquity. The tower, however, remains intact. It is of that version of Early Romanesque which we commonly call Saxon. It is in diminishing stages, not in an upright mass, as the tower of St. Michael's, Oxford. The material is rough masonry, the quoins being in "long-and-short" work. Of the three stages of which the tower is composed, the lowest occupies nearly half of the entire height. The divisions are made by plain shafts. The courses. The tower is decorated with the nave by a massive semicircular arch having capitals adorned with roughly-carved representations of animals. Of the church contemporary with the tower only a few fragments remain built into the existing walls. The nave is of the 13th century. The south aisle, the chancel is formed by building that in Medieval times consisted of an upper and lower chapel, the former of which was used as a lecture-room. This building, deprived of many interesting features, is still connected with Corpus Christi College by a gallery supported by a four-centred arch. Much the finest example of First Pointed in Cambridge is what is now, and has been since the early part of the 16th century, the Chapel of Jesus College, formerly that of the Nunery of St. Rhadegund. It was erected between the years 1150 and 1245, the north transept being the oldest portion of the existing building. It is originally in the shape of a cross, with a tower in the centre, and had, in addition to the transepts, aisles on the north and south sides of the eastern limb, flanking it along half the extent of its walls, and forming chapels, which opened into the chancel by two pier arches

in each wall. Of peculiar beauty are the piscina and sedilia; the series of lancet windows, with blind arcading between them, in the chancel; and the roof-story gallery, on the inner side of the tower walls. The piscina was thought so beautiful that it was copied in the parish church of Histon, to the north of Cambridge, and in the ancient Hospital of St. John, where St. John's College now stands. Upon this splendid fabric Bishop Alecock of Ely brought what was little else than ruin in transforming it into a college chapel. A considerable amount of his work has since been undone in our own day, and there appears to be no reason beyond the expense that would be incurred to prevent the whole being brought back to its primitive condition. The Cambridge example of the Second Pointed style is the fine church of St. Mary-the-Less without Trumpington Gates, attributed to Alan of Walsingham, remarkable for its window tracery, and particularly for that of its east window, in which some see an approach to the Flamboyant character. The first church on this site was in the Norman style, but fell down about 1530. The actual church of St. Mary-the-Less was the Martin Chapel of Church in Oxford, to serve both for the college and the parish. It is a lofty body without aisles or any structural division between nave and chancel. The length is 100ft., and the width 27ft. The church is divided into six bays, each of which is except the west window, a lofty double square in plan. It is lighted by lofty windows having between them deep buttresses. The tracery of the windows on the north side is all modern, with the exception of that in the easternmost bay. In the eastern gable and in that on the south side are windows, the tracery of which is exceptionally rich and flowing. The tracery is in the same style, and even from the same patterns as that of the date in Ely Cathedral. At the east end of the church is a vestry in two stories erected against the south wall of the easternmost bay, whilst against the next bay is an apartment or vestibule, entered from the south side of the choir. An ancient stone staircase leads from this vestibule to the gallery communicating with the college. At St. Edward's Church the aisles to the north and south of the chancel belonged, that on the north to Trinity Hall, and that on the south to Clare College. The south aisle of the choir, an ancient served ancient as the chapel of Michael House, one of the collegiate establishments on the site of Trinity College. The north aisle was the chapel of Gonville Hall. St. Mary-the-Great is the University church. It has a lofty nave, with span aisles, and lighted by twenty windows in the clerestory.

THE CHRONOLOGICAL ORDER OF COLLEGIATE BUILDINGS.

One might be tempted to think on entering a college that the chapel was the most important building, the first built, and that all the other buildings had clustered round it. That is not the historical fact. The least ambitious part, the chambers, comes first. Originally chambers were lodgings in private houses, such as the accommodation—if such it can be called—of the University in London or in the 18th-century towns. Some houses were of sufficient importance to have parts of the parish churches appropriated to them. Then colleges came to build their own chapels, of which arrangement Penubroke is the earliest example in Cambridge.

THE CHAMBER, THE HALL, THE CHAPEL.

such was the progressive development. Eventually, with the exception of St. Mary's, the parish church ceased to enter into university life. So also have most of the other churches in the Middle Ages, there were many more built in Cambridge. The monks of Ely had one chapel, those of Croyland another, those of Norwich a third. Of the Friars, the Franciscans established themselves at Cambridge as early as 1224; in 1249 the Carmelites moved in from Chesterton to Newnham; in 1257 the Friars of the Order of Bethlehem settled in Trumpington-street, and in 1258 the Friars of Penitence settled in the parish of St. Mary-the-Great, whence they afterwards removed to the parish of St. Peter's, where their buildings were eventually absorbed by Peterhouse. There were added to these at a rather later date the Friars of St. Mary, and the Friars of St. Andrews the Dominicans. The Austin Canons had been for two centuries and a half established at Barnwell Priory, and the brethren of St. John's Hospital—also under the rule of St. Augustine—were established in 1175 by Henry Frost, a

Several valuable gifts have recently been made, and are now placed in position. A native of Brechin has filled all the windows of the choir with stained glass. The scheme of subjects was arranged by the Rev. Mr. Mackenzie, and the north side the windows display scenes in the life of Christ prior to the public ministry—The Nativity, the Flight, the Presentation, the Baptism, the Temptation. On the south side there are—The Transfiguration, the Betrayal, the Crucifixion, the Resurrection, and the Ascension. In the middle aisle the windows of the second window represent the Redeemer's offices as Prophet, Priest, and King; while the rose window over is filled with the Agnus Dei surrounded with cherubs and seraphs. The windows were executed by Mr. Henry Holiday, of London. At the east end of the south aisle the window of memorial oak is filled with the figures of St. Paul and St. Peter. The corresponding window in the north aisle contains figures of Isaiah and John the Baptist. The Communion table and pulpit were made of fine oak, are the gifts of the Women's Guild of the congregation. At the north end of the choir has been placed a large Coromandel lamp.

The outfall works at first constructed became in time inadequate, and they were greatly enlarged in 1898, and the present system of dealing with the sewage was then started. This method consists of treating the crude sewage with milk of lime and ferrous sulphate, and then passing

through settling tanks. From the settling tanks the effluent is taken into coke-burning bacteria beds, and from thence to the River Koking, the sludge left in the tanks being pressed by sludge-processing machinery. Owing to the works being required to deal with a considerably larger flow than that for which they were designed, the effluent has become unsatisfactory, and other modifications in the works are now being undertaken. The chief of these is the construction of an entirely new outfall to the River Thames. This effluent pipe will discharge into the Thames below the London Northern Outfall atarking. As this outfall pipe, which is 30 in. in diameter, passes through a large tract of land lying below high-tide level, elaborate precautions have had to be taken to prevent tidal water being admitted to the low-lying land by any failure of the pipe. The scheme as a whole presents some interesting points as regards meeting the ever-recurring problem of treating the sewage of a district with a rapidly increasing population without discarding the existing system which was never designed for great enlargement.

WHITBY ABBEY, YORKSHIRE.

IN THE BUILDING NEWS for April 15, 1898, some illustrated details of the choir arcading of the above abbey were given, which were then briefly described. We now give herewith illustrations of the entire arcading and of the east transept, both interior and exterior, with a plan of the abbey as it now stands. 13th-century architecture is here characterised by its boldness, effective detail, and noble proportions. The choir arcading is here restored by study of the fragments remaining. The western transept, however, the nave and transept, has evidently been influenced by the monastic buildings, which originally extended on the south-western side of the church. The stone is in remarkable preservation, and the remaining details are sharp, and practically unaffected by the weather and time. A peculiar characteristic of parts of this ruin is the amount of scissile vegetation now grown and included in the masonry. The abbey, built on a commanding cliff, is quite near the storm-washed rocky shore of the North Sea. The drawings herewith reproduced are by Mr. Archibald H. Winterbottom, Architect, West Brynton. [We have another drawing of his, which we shall give shortly.]

HUDSON AND KEARNS' DIARIES FOR 1902.

ONCE again the arrival of Messrs. Hudson and Kearns' Biotting-Pad Diaries reminds us of the necessity incumbent on all who use these indispensable desk-remembrancers — and who does not? — to make their selection, and give their order.

"No. 38," the "Banker's Diary" are pre-eminently complete, as usual; but all are good, as usual, and the durability and good manufacture beyond praise. We are almost anxious to say that we are writing this on a "two-year-old pad," in which a considerable amount of private memoranda has been entered during 1900, which it was inconvenient to dispense with during the year now drawing to a close, and barely any signs of wear and tear are visible. We shall supersede it in favour of its successor presently with all the regrets due to a faithful friend.

The "Architects' and Builders' Book Diaries" are so unique and comprehensive that no professional man or employer can afford to do without them. They are brought thoroughly up-to-date, and are beyond rivalry either as regards price or completeness.

The builders' premises of Messrs. Ross in Claremont-road, Sparkbrook, Birmingham, were destroyed by fire on Saturday.

In continuation of a long series of yearly pleasant social gatherings, the Liverpool operative plumbers held their 34th annual dinner and dance at the City Hall, Ebenezer-street, in that city, where there was a large assembly of members and their friends. The president was Mr. Thos. H. Wiggins, and amongst those who gave him support were Mr. James Hoos, the president of the scheme; Mr. G. H. Hughes, secretary; Mr. G. Skillidon, treasurer. The balance-sheet for the year was submitted, showing that after the payment of grants to the district and district members there was a balance in hand of about £26 10s.

OBITUARY.

The death is recorded, at the age of 75, of Mr. JOSH CAMPBELL, F.R.I.B.A., who went out to the Crimea during the war as assistant to a firm of contractors, and was present at the fall of Sebastopol. Shortly after the suppression of the Mutiny Mr. Campbell sailed for Bombay, and became a firm of architects, under whose direction the Elphinstone Circle, the Victoria and Albert Museum at Bhyculia, and the dome of Talsi lake (one of the sources of the Bombay water supply) were constructed. Later he became senior partner in another firm, and from plans prepared by him a number of the prominent buildings in the city of Bombay were carried out, such as important irrigation works in Southern India. Mr. Campbell had been a Fellow of the Royal Institute of British Architects since 1888. He was also a member of the Society of Architects, and the secretary of that body at Bombay.

MR. EVAN ANGELL, C.E., whose death at Ramsgate is announced, supervised the construction of various tramways and widenings on the London and North-Western Railway Company's system, amongst others, between the years 1873 and 1880, the Little Hulton extension from Bolton to Kenyon. He also had charge of the construction of a branch line at Guide Bridge, and subsequently of the Longsight and Ardwick, and projected line in connection with the latter, the railway bridge carrying the main line to London over Stockport-road at Longsight was removed.

CHIPS.

Survivors have been made and preliminary notices served on behalf of the promoters of a central railway between London and Brighton, who will seek Parliamentary powers next session. The London terminus will be in Lupus-street, Westminster, near minutes' walk from Victoria Station, and the projected line will proceed through Vauxhall, near Wandsworth-road Station, Clapham Park, and Streatham, and in a nearly direct line to a terminus in King's-road, Brighton.

A dedication service was held by the Bishop of Bristol at the Abbey Church, Malmesbury, on Friday, for the purpose of dedicating a central glass window, which had been placed there by Mr. and Mrs. Hollis Luce, in memory of their son, who was killed in action at Diamond Hill, the 2nd of the Welsh Guards, and three life-size figures, Faith, Courage, Devotion. Above them is a scroll, "Be thou faithful unto death and I will give thee a Crown of Life," surmounted by a winged cherub.

Mr. Baldwin Latham's report upon the Calcutta suburban drainage scheme has been received by the municipality of that city.

At the next meeting of the urban district council of Aston Manor, the Highways Committee will unanimously recommend that the salary of the surveyor, Mr. Jack, be increased from £250 to £255 per annum, such increase to take effect from Jan. 1 next. Mr. Jack was appointed in April, 1900, and besides discharging the ordinary duties appertaining to his office he has prepared schemes to the extent of £30,000.

The foundation-stone of the new bridge over Railway-street, Chatham, was formally laid last week by the mayor of that borough, Alderman C. E. Skinner, architect. The total cost of the work, which includes the construction of a central fire-station on one side, and of public lavatories on the other, will be about £12,000. The architect and engineer is Mr. A. T. Walsman, M.Inst.C.E., of London.

A memorial window to the memory of the late war was unveiled on Friday, All Saints' Church, Hillingbourne, Kent. The window forms part of a scheme of figures illustrating early Church history, with which it is hoped that the remaining windows on the south side and choir will be eventually filled. In this, the three Patron Saints are represented—St. Andrew, Scotland; St. George, England; and St. Patrick, Ireland. The artist is Mr. E. J. Priest.

The neighbourhood of Wellington, Somerset, has been the scene of a public funeral, by the death of W. A. Richards. Deceased, who was 80 years of age, held until the time of his death the office of surveyor for the Wellington Rural District Council, and for many years prior to his appointment of that body he was surveyor for Milverton Highway Board.

Earl Beauchamp, on behalf of the subscribers, presented to the Mayor of Worcester, on Tuesday, at the Guildhall, the City's memorial portrait of the late Mayor, painted by the artist, who, in 1871, was 60 years of age, by Royal command. The portrait was unveiled at a civic reception by Lady Mary Lygon.

COMPETITIONS.

JOINT INTERIORS DEPARTMENT HOSPITAL FOR EAST PERTHSHIRE BOROUGH.—A meeting of the sub-committees from the town councils of Blairgowrie, Rattray, Alyth, and Coupar-Angus was held at Blairgowrie on Tuesday, to decide as to the proposed joint infection hospital to be erected on the site of the old Rattray. After discussion, it was agreed by nine to four that fourteen beds be provided, and plan No. 5, by Mr. Lake, Falconer, Blairgowrie, was unanimously adopted, subject to the approval of the Local Government Board.

LIVERPOOL.—A meeting of the general committee of the Liverpool Queen Victoria Memorial Fund was held on Oct. 31, the Lord Mayor presiding. It was reported that in response to the invitation of the committee a large number of designs have been received. After full consideration the committee have awarded the three premiums which they offer, and the designs adjudged first, second, and third in order of merit viz.: First premium £100, to Mr. H. Lindsay Clark, sculptor, of Messrs. H. H. Martyn and Company, Ltd., Cheltenham, associated with Mr. R. A. Briggs, F.R.I.B.A., of London; second premium £75, to Mr. G. Allen, architect, of Liverpool; and Messrs. Frederick Simpson, W. E. Willink, and P. T. Thicknesse, architects, of Liverpool; third premium £50, to Mr. Henry C. Fehr, of South Kensington, associated with Mr. J. S. Gibson, architect. The committee have asked each designer to submit a complete set of drawings, and until such is received no decision will be arrived at by the committee as to whom the order shall be intrusted. In the mean time the committee have decided that the designs shall not be exhibited to the public.

PENANCE.—The town council at their last meeting adopted a report by the pleasure grounds committee, relating their recommendations made on the 7th Oct., and then referred back, for the award of the first premium for plans for laying out the promenade field to the author of plan No. 60. They also recommended that the second premium be awarded to the author of the plan "Simplex." The designs were accepted by the pleasure grounds committee, and the estimated outlay is £7,000.

A new Wesleyan chapel was opened at Morcott last week. It is Gothic in style, and has been built by Messrs. Joyce Brothers, also of Morcott.

At the last meeting of the North Riding County Council, Mr. Walter H. Brierley, Lendal, Yorks, was appointed county architect at £100 a year, the highest salary yet offered, and a commission of 5 per cent. on new buildings. Mr. W. G. Brynning, Fulwood, Preston, was appointed, by the chairman's casting vote, county surveyor at a salary of £100 a year, advancing to £500.

Mr. W. R. Hornesdale, Mayor of Hackney, has formally opened the Electricity and Refuse Destructor Works, which have been built in Mill-lane-road, Lower Clapton, by the Hackney Borough Council, at a cost of £285,000.

At a meeting of the Yorkshire Dales Railway Company, on Tuesday, a report was submitted by the engineer, Mr. G. A. Ferguson, stating that satisfactory progress was being made in the construction of the line. Eleven bridges had only a small portion of masonry to be erected, and were complete, and the others only remained 400 yards' length to complete the formation of the railway to 8½ miles. Six and a half miles of the permanent way were laid in correct position, and a great portion was ballasted.

The rural district council of Moxheath have elected Mr. John Macgregor, road surveyor to Wharfedale Urban District Council, as road surveyor in succession to Mr. W. L. Gibson, who has obtained a better appointment in Scotland. The salary of the new surveyor was only £180 a year, 112 candidates offered their services.

The isolation hospital now being erected at Mitchell Laithes, Dewsbury, was inspected on Tuesday by the hospital board. The large wards are almost ready for occupation, and the sanitary block and the isolation hospital are making good progress. The cost of the whole is £21,000.

The Executive Committee of the Liverpool Cathedral scheme adopted, on Monday, an organisation plan, and appointed Mr. J. H. St. John, Church Curate, M.A., secretary, and Mr. St. John, curate of St. Helen's.

At a meeting of Glasgow Parish Council, on Tuesday, tenders amounting to £13,690 s. 1d. for diggers, masonry, brick, iron, and steel work of the new Eastern District Hospital were accepted.

Building Intelligence.

BATH, ABBEY.—At the Guildhall, Bath, on Tuesday, a meeting was held of the executive committee of the Abbey Restoration Fund. The town clerk, who is hon. treasurer, presented a statement of accounts showing that £2,862 had been taken on account of the work done. They had £250 in hand, against which there was only to be set the cost of removing dangerous parts of the pinnacle on the north transept. The Bishop of Sheffield, Dr. Quirk, said four of the buttresses had been repaired, and the fifth must be rebuilt at a cost estimated by the architect at £164 17s. They then had in hand sufficient to repair the pinnacles, estimated in all to cost £600 or £700. Towards this there is £315 in hand. It was also resolved to fix in the Abbey a marble plate bearing an inscription to the effect that the restoration of the exterior of the Abbey, including the work thereon, was undertaken during the readership of Canon Quirk, and completed as the memorial of the church and city to his service.

CARLISLE.—The Suffragan-Bishop of Hall consecrated on Thursday a new church at Gillingham in the parish of Brotton, in Cleveland. The church, which contains seating accommodation for 340 worshippers, has cost between £2,200 and £2,300, the contract being carried out by Messrs. Cradock and Sons, Guisborough. It is from designs supplied by Messrs. Hick and Charlesworth, Newcastle-on-Tyne, and is built of red bricks, with terracotta facings. The roof is of the barrel type carried in pitch-pine, covered with red tiles, and in the centre of the ridge of the roof a spirelet rises to a height of several feet. An organ-chamber and vestry are constructed on the same level as the chancel. The church is seated throughout with cane pews, and is heated with hot air from a heating-chamber underneath the vestry.

CHARING CROSS HOSPITAL.—The reconstruction of the basement of Charing Cross Hospital, which necessitated the closing of the institution from the middle of July to the end of September, has been completed. A large and airy kitchen, with new apparatus for cooking by gas and steam, has been erected. In addition, a scullery, two larders, and two storerooms and a servants' hall have been constructed, to which must be added a workshop for the engineering department adjoining the new boiler-house. The cost of these improvements, including the new boilers and the new sanitary annex to the wards of the south wing of the hospital, amounted to £12,000. For the reconstruction of the new buildings, which comprise an improved out-patient and casualty department, a suitable house for the nursing staff, quarters for the resident medical and surgical staff, isolation wards, and wards for special diseases, the tender of Messrs. Holloway Brothers for £82,750 has been accepted; but at least £100,000 will be required before the new Charing Cross Hospital will be completed.

COPPENHALL, CREWE.—Mr. Alderman Richard Pedley is, says a Cheshire journal, developing his state at Coppenhall. He has just let a contract for the erection of a large brick engine-house and American driers, which, with machinery, will cost about £4,000. The work is now in operation. The machinery will be capable of making and turning out from 80,000 to 100,000 bricks a week, and this will be the output when the works are ready about January next. The works will occupy about one acre. Alderman Pedley has about 14 acres of clay land, and a depth of 17ft. is to be extracted. A square yard of clay to a depth of 17ft. will produce 100,000 bricks. The clay beds will be worked at a capacity of 80,000 or 100,000 bricks a year.

EASTON, BRISTOL.—The new church of All Hallows', Easton, Bristol, was consecrated on Saturday. The scheme provides for a building accommodating 800 worshippers, but this has not yet been completed, the work accomplished including the choir, sanctuary, north and south transepts, chapel, and three bays of the nave and aisles. The style is English Decorated. The walls are faced externally and internally with red

Pennant stone, Bath stone being used for the dressings, and an open-timbered roof has been provided. The chief feature of the church is the apsidal termination of the east end, which has an ambulatory around it. The choir and sanctuary are large and lofty, the apparent height being increased by the arcades between the choir and the transepts. The choir-stalls have not yet been executed, and the pulpit is a temporary one. The church will be heated by warm air. The contractors for the building are Messrs. R. Wilkins and Sons, of Surrey-street, Bristol, and the architects are Messrs. Crisp and Outley, of Edinburgh Chambers, Baldwin-street, Bristol.

GLISTON, BRISTOL.—A new church in Gliston, near Glastonbury, is being erected by the Bishop of Manchester. The site, at the junction of Forester-street and Ristdon-lane, has been given by the Earl of Bradford, and the church stands with the west front facing Ristdon-lane and tower at south-west angle. It provides accommodation for between 600 and 700 worshippers. The school, which has been closed and occupied for some time, is placed behind the church and fronting Forester-street. It accommodates 450 scholars, but is arranged for future extension to about 650. The whole of the works have been carried out from the designs and under the superintendence of Mr. R. Knill-Freeman, of Bolton.

NORTHWICH.—At the last meeting of the urban district council of the town of Northwich, to communicate with Sir John T. Brunner, Bart., M.P., the donor of the free library, with reference to the recommendation of the joint meeting of the council and the management committee of the institution in question, urging the consideration of taking down the present building and erecting a new one, the council resolved on the erection of new premises to provide accommodation for municipal offices as well as a library and museum. This is owing to a report submitted by Mr. Joseph Cawley, M.S.A., of Northwich, showing the large sum it will necessitate to put the present structure, which has sustained considerable injury through subsidence, in a thoroughly safe condition.

PLASTOW, E.—The official opening of the extension of the new hospital at Plastow, built for the West Ham Corporation from plans by Mr. Edwin T. Hall, F.R.I.B.A., took place on the 25th ult. The buildings adjoin an old hospital formerly belonging to the Poplar Board of Works, but practically constitute a new institution. They are of red brick, with terracotta dressings, and consist of a main portion containing fifteen beds on two stories, in various wards, three new scarlet-fever pavilions, the larger of which provides 31 beds on two floors. There is no inside communication between the floors, the one being divided from the other by a concrete and steel floor, with suspended ceiling. This construction is practically sound, as well as fire-proof. The pavilion contains two large wards, each of 11 beds, one 2-bed ward, and one 1-bed ward, a room for the sister, and two ward kitchens. There are on each floor, close to the staff-rooms, lavatory and w.c. for the use of the nurses, as well as a larder and linen-room. For the use of the patients there is a detached sanitary building with a connecting-brIDGE having through currents of air. This contains, on each floor, two baths, two w.c.s, four lavatory basins, and a nurses' sinkroom. Each large ward is 83ft. by 26ft., and 13ft. high. In the centre is a fireplace stack ventilating two fireplaces, and around the smoke flues are grouped aspirating flues, the intake of the vitiated air near the ceiling. These stacks are of special construction, designed by the architect. All the smoke-flues are swept from the open basement. In addition to the flues, there are hot-water radiators, inclosed in cases, into each of which fresh air, admitted at the bottom, and passes over the radiator coming out at the top, warmed to a temperature about 60°. Under each of the 14 beds there is an inlet ventilator for cold fresh air. The floors are of teak, laid on the solid concrete, and the walls are all of cement, painted and stained. A cubic space of 2,000 cu. ft. is provided for each patient. All internal angles are concave. There are external staircases throughout the hospital leading to the upper floors of the wards, and lifts for the service of the first floor with coals, food, &c., and there are iron fire-escape stairs from each upper floor. Attached to each pavilion is a paved airing court, inclosed by a open steel fencing. At the entrance to the

diphtheria corridor, a disinfectant room, and the pavilions, although different in size, are similar to that already described, while a dispensary of 2,500ft. per patient is provided. The staff house is H-shaped on plan. Each nurse and servant has a separate bedroom to herself, the nurses' rooms with fireplaces, the servants' room heated by hot water, all well ventilated. The lavatories, w.c.s, and lavatories are placed in detached sanitary towers on the north-east side; in all 170 beds provided for patients, Messrs. Doby and Wilkinson, of Westminster, were the consulting engineers, and Mr. Mills the clerk of the works. The new buildings have been erected by the district employment labour committee, on the authority of the council, under the direction of Mr. George Wise, the manager; the general foreman being Mr. R. Jacobs. The specialists for electric wiring and lighting are Messrs. Young and Marton, Ltd., of Stratford; for boilers and steam piping, Messrs. Tinkers, Ltd., of Hyde; for heating and hot-water supplies throughout the hospital, Messrs. Z. D. Berry and Sons, of Westminster; for laundry fittings, the Cherry Tree Machine Co., Ltd., of Blackburn; for kitchen fittings, Messrs. J. and F. May, of Holborn; for fire mains and appliances, Messrs. Shand, Mason, and Co., of Glasgow; for electric bells, fire alarms, and telephones, Messrs. Croghan and Co., Ltd., of Upper Thames-street, E.C.; for asphalt, the Val de Travers Asphaltic Paving Co., Ltd., of Bishopsgate-street; and Messrs. Pilkington and Co., of King William-street; for disinfectors and destructor, Messrs. Manlove, Allott, and Co., Ltd., of Nottingham; for Bangor slating, Mr. J. J. Etridge, and of Bethnal Green; for lifts, Messrs. E. Waygood and Co., Ltd., of Borough, S.E.; for terracotta dressings, Messrs. J. Sill and Sons, of Lambeth; and finance chimney stacks in the wards, Messrs. Doulton and Co., Ltd. The red brick facings have been supplied by the Brick Galleries, Ltd.; the stock bricks by Messrs. Wakeley Bros., Ltd.; blue lias and scientific lime by Messrs. C. Nelson and Co., Ltd.; glazed bricks throughout by the Farnley Iron Co., Ltd.; Portland cement by Messrs. Martin, Earl, and Co., Ltd.; white glazed baths and lavatory basins by Messrs. Doulton and Co.; white and brown glazed channels and gullies by Messrs. Broad and Co., Ltd.; drain pipes by the Archer Sanitary Tube Co.; Palmer's patent flushing tanks by Messrs. J. Knowles and Co., Ltd.; glazed stoneware manholes by Messrs. J. Giff and Sons, Ltd.; w.c.s, w.r., g. urinals, and slop-sinks by Messrs. Dent and Holroyd; patent hot and cold-water taps by Messrs. B. Rhodes and Son; floor springs for doors and the opening gear for fanlights and door lights by Messrs. Smith and Turner; stoves and chimneypieces by the Albion Iron Co. and Messrs. Yates, Haywood, and Co.; oak joinery, doors, and iron fire-escape stairs by Messrs. Dent and Holroyd; gutters and pipes by Messrs. Macfarlane and Co., Ltd., and Messrs. McDowell, Steven, and Co., Ltd.

The unutilized tower of Somerset parish church, Hants, is now undergoing restoration and repair. The work is being carried out by Mr. R. Wade, of Dodington.

By a compositor's blunder the amount of the premium to be paid to each architect who takes part in the final competition for Liverpool Cathedral was stated in the issue of 28th, to be "three" instead of "three hundred" guineas.

At Tuesday's meeting of the London County Council, a recommendation by the Water Committee that a Bill for the purchase by the Council of the undertakings of the eight Metropolitan water companies be promoted in the next Session of Parliament was carried by 82 against 20 votes after considerable discussion.

At Starchley, near Birmingham, the new Church of the Ascension has been consecrated by the Bishop of Coventry. The church, which has accommodation for 375 persons, is in the later Decorated style, and has a nave 82ft. by 35ft., with ambulatory aisles borne upon five low arches. The chancel is 32ft. 6in. by 22ft., the roof being wagon-shaped and divided into panels, while there is a semi-light east window. On the south side there are the choir vestries, the latter being carried up as a tower, in which is the organ chamber. There is a ringing loft and belfry, in which provision has been made for a peal of eight bells. At the west end of the nave is an apsidal baptistry. The walls throughout are of brick, with external dressings of red terracotta, and the internal piers, arches, and dressings are in Farleigh Devon Bath stone. The total cost has been £8,100.

PROFESSIONAL AND TRADE SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The members of this association held a reception on Monday evening, on the occasion of the formal opening of their new rooms at 117, George-street. The guests, who numbered about 250, included Sir J. R. S. A. and Lady Reid, were received by Mr. Henry F. Kerr, the president. The new rooms, which are situated on the first floor, are commodious and beautifully decorated. At the opening ceremony, which took place in the hall of the Royal Scottish Society of Arts, the president, after the usual remarks in his address, said that they did not only mark the acquisition of a home for the members, but the amalgamation of the Architectural Society—one of the terms of amalgamation being the acquiring of rooms. The Edinburgh Architectural Association was founded forty-three years ago by a band of zealous young students, who felt that the senior body, the Architectural Institute of Scotland, did not give them the scope or freedom that they desired in the prosecution of their art. At the close of last session the association numbered some 260 members. The Architectural Association in its maturity did not differ in the requirements of the rising generation of architectural students, and history very much repeated itself in the hiving off of the younger men and the forming themselves into the Edinburgh Architectural Society, which a few weeks ago was formally united to the old association. He could not say that the association was jealous of the younger society, but he confessed that it was enamored, and for two years it pressed its ardent wooing, until at last the society happily agreed to the union. Now that the association had a bride it had hastened to provide a home, in which he trusted there would be a continuance of happiness and esteem, and that the objects of the union, the training of the students, and the guarding of the interests of the profession and the art of architecture would permanently remain in the hands of the Architectural Association. The President intimated that the rooms were already partly furnished by the gifts of members, and that it was hoped that the entire furnishing of the rooms would be accomplished in that way, so that the somewhat slender funds of the association would not be encroached upon. He concluded by calling upon Mr. George Reid to declare the rooms open. Sir George said he had great pleasure in formally declaring the new rooms open, and asked those present to join him in wishing the association many prosperous and happy days in its new home. Bailie W. S. Brown, on behalf of the corporation, then made a few remarks. Members of the corporation, he said, were asking themselves whether Edinburgh should not adopt the course taken with such success in some cities, and allow the new works to be open to competition among the architects throughout the country. Professor G. Baldwin Brown, F.R.I.B.A., as representing the University, also spoke, and suggested that they might start a movement which might result in doing something towards a further systematising of the education of the architect. He should like to see Edinburgh white-washed with the London Institute of British Architects in London; also a chair of Architecture founded, preferably in the University. The company then adjourned to the new rooms, where light refreshments were served. A musical programme was also carried through in the course of the evening. The following gentlemen constituted Association now comprised Fellows, Members, and Associates. The Associates' section is to have a series of meetings and papers of its own, and has appointed the following office bearers:—Chairman, Mr. J. Stuart Syme; vice-chairman, Mr. J. F. McEwen; hon. secretary, Mr. J. James Milnour; Messrs. G. S. Milnour, D. Davidson, Hay Laymont, J. Jordan, B. S. Murphy, and A. T. Armit.

GLASGOW ARCHITECTURAL ASSOCIATION.—A meeting of this Association was held in their rooms, 187, Pitt-street, on Tuesday night (5th inst.). The President, Mr. Chas. E. Whitelaw, in the chair. A very interesting memorial paper, by Mr. James Milnour, was read on "Voices in Stones or the Language of Architecture." At the close of the paper Mr. Alexander McGibbon, F.R.I.B.A., opened the discussion, which was continued by a number of members.

LIVERPOOL ARCHITECTURAL SOCIETY.—The second ordinary meeting of this society was held on Monday at 41, Castle-street, when a lecture

on "The Ancient Streets and Boundaries of Liverpool" was given by Mr. W. Ferguson Irvine, the hon. secretary of the Records Society of Lancashire and Cheshire. The lecture was illustrated with limelight views.

SCOTTISH BUILDING TRADES FEDERATION.—The second annual meeting of the Federation was held on Friday in the Cockburn Hotel, Bath-street, Glasgow. Representatives were present from the various districts of the country, including Inverness, Keith, Aberdeen, Arbroath, Dundee, Perth, Stirling, Edinburgh, Glasgow, Hamilton, Coatbridge, Dunfermline, Paisley, and so on. Mr. Alex. Beveridge, builder, Perth, the president, occupied the chair. Mr. James L. Selkirk, C.A., Glasgow, submitted the annual report, which narrated the work undertaken during the past year by the executive to extend and consolidate the organisation throughout the country. The constitutive committee, consisting of four representatives from each of the four principal cities, had been keeping themselves informed as to the state of the building trades during the year, with a view to rendering assistance in any of the districts where such might be required. They had endeavored to induce more men to attach to their work, because by being kept informed as to the prospects of trade they were in the best possible position to render timely and suitable advice and assistance. The question of finances was specially dealt with, and energetic steps were resolved upon to place the Federation in a strong and healthy position financially. Various other matters were considered, and resolutions arrived at regarding them. Office-bearers for the ensuing year were appointed as follows:—President, Mr. Robert Lamb, builder, Edinburgh; vice-president, Messrs. Thomas C. Duckie, Perth, Dundee, and John Morgan, wright, Aberdeen, together with eleven members of the executive in room of those retiring at this time; secretary, Mr. James L. Selkirk, C.A., Glasgow. The next half-yearly meeting of the Federation was appointed to be held in Perth, and the next meeting of the executive in Dundee.

WOLVERHAMPTON AND DISTRICT ARCHITECTURAL ASSOCIATION.—At a meeting of the above newly-organised association held on the 29th ult., it was decided that the meetings should be convened for purely business purposes. They were fixed to be held quarterly—that is, on the third Thursday in January, April, July, and October. The first meeting, which will be held on the 10th January next, when the president will give an address, and reports will be received from the treasurer and secretary. The election of officers for the ensuing year will also then take place.

The workmen of Mr. J. C. Kirtley, contractor, Sunderland, who are putting in intercepting sewers, as part of the new sewage disposal works at Morpeth, have laid here the foundation of the north abutment of Morpeth old bridge. The date of the bridge is unknown. At the latest, it is regarded as very early Norman; in all probability, it was pre-Norman.

A large meeting of Old Harrovians was held at the Westminster Palace Hotel on Tuesday to consider proposals for enlarging the school chapel, in memory of Old Harrovians who have lost their lives during the war in South Africa. The school has been 18 of its old boys, the last of the group being Colonel Benson. The memorial, as adopted at the meeting, will take the form of an extension eastwards of the north and south aisles, and the cost of the scheme, which has been suggested by Mr. Aston Webb, A.R.A., will be about £5,000.

The Bishop of Winchester consecrated, on Tuesday, the new church of All Saints, Eastworth, in the parish of Chertsey. The church is decorated in style, and is built of brick and Bath stone, in a commanding situation on the Eastworth-road. It consists at present of nave, chancel, and side aisle, tower, and vestry, and will seat 300 people. Space is left for the second aisle to be added, and the new one which will give accommodation for an additional 100 sittings. The building now completed, together with the purchase of the site, cost £5,000. Mr. J. Henry Christian is the architect.

On Friday evening, at Rothbury Parish Church, the new pulpit and chancel screen to the memory of the late Mrs. Mary Ann Webb, of Rothbury, stalls and stained-glass window to the memory of the Rev. Canon Young, were solemnly dedicated by the Bishop of Newcastle.

A number of street improvements necessary for the extension of the electric tramway through out the borough of Oldham are to be incorporated in a Parliamentary Bill. The estimate of total cost is £334,425.

Engineering Notes.

LIGHT RAILWAYS.—The Light Railway Commissioners—the Earl of Jersey, Colonel Boughay, and Mr. Steward—sat last week at Tottenham to hear the application of the British Electric Traction and Light Railways Society for an order authorising the company to make and use certain light railways in the counties of Middlesex and Essex. Originally the promoters intended to construct 14 short lines in the parishes of Tottenham, Walthamstow, Leytonstone, Waltham, and Waltham Cross. Some of the lines were, however, abandoned, owing to the opposition of local authorities, and the scheme which the Commissioners were asked to sanction consisted of the remaining seven lines, affecting Tottenham and Walthamstow, the total length being four and a half miles. The scheme was presented on behalf of the urban district council of Walthamstow, who desired to undertake for themselves the construction of light railways in their district. The promoters required for the carrying out of their undertaking three small plots of land, comprising altogether about half an acre, forming part of Epping Forest. Mr. James B. Porter appeared for the City Corporation as conservators of the forest, and explained that the Corporation felt obliged to withhold their consent to the alienation of any part of the forest. At the termination of the inquiry, Lord Jersey announced that the Commissioners had decided not to allow the scheme to proceed so far as regarded the Walthamstow portion, and the promoters thereupon elected to drop the remainder of their scheme.

CHIPS.

The urban district council of Litherland decided, on Monday, after a long discussion, to give two months' notice to their surveyor.

On Saturday afternoon the foundation-stone was laid of a new church which is to be erected at Dulrys, Walsall, a district of rapid growth, the whole population of which, numbering 5,000 or 6,000, has sprung up in quite recent years. The church is to take the place of an ancient structure, and a new parish is to be formed. The contract has been undertaken by Mr. W. Hopkin, of Birmingham, for £4,400, the architects being Messrs. J. E. K. and J. P. Cutts, of London.

For the first time in the history of the arts, an academically-accredited woman architect has come to the front in France. She is a young American student named Julia Morgan, and belongs to San Francisco. When the courses of the Beaux Arts were first thrown open to the study of girls, Miss Morgan was the only one of her sex then or since to elect for architecture, in which she has just taken honours.

A carved oak chancel screen has been erected in All Hallows' Church, Whitechurch, by the parishioners in memory of Queen Victoria. The screen, which cost about £100, and was dedicated by the Bishop of Guilford on Friday last, bears the inscription:—"In the glory of God, and in memory of Queen Victoria. This screen was dedicated Feast of All Saints, 1901."

The Local Government Board have ordered the Birmingham Board of Guardians to extend the farm buildings at their homes at Marston Green, and to build for labourers' cottages, at a cost not exceeding £1,784.

The little Early English church of Winwick, Huntingdon, has just been restored at the cost of the Duke of Buccleuch. The work has been carried out by Messrs. Patrick, of Gedding.

The Light Railway Commissioners—the Earl of Jersey, Colonel Boughay, and Mr. A. Steward—have resumed at the Guildhall, Westminster, the inquiry which was begun last week at Finchley, into the application by the Middlesex County Council for an order authorising the construction of light railways in the county of Middlesex. These lines are intended to link up the lines which the Commissioners have sanctioned from the London system to Wood Green and New Barnet, and then, which was at first very great, has dwindled down to that of the frontagers. Lord Jersey said the Commissioners would recommend the sanction of all but the small portion from Crocklewood to Hendon.

The inaugural meeting of the eighteenth session of the Dundee Institute of Architecture, Science, and Art was opened in the Technical Institute, Snell's Wynd, on Saturday, by a lecture on "The Progress of the Arts and Crafts and Lessons," by Professor Patrick Geddes, of University College, Dundee. The president, Mr. J. F. Bruce, architect, occupied the chair.

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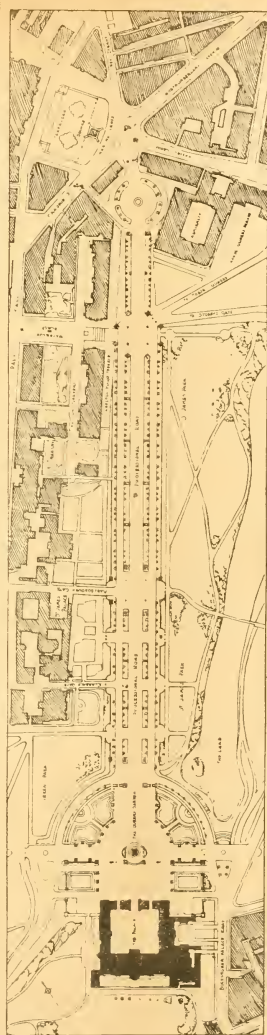
ILLUSTRATIONS.

COMPETITIVE DESIGNS FOR THE QUEEN VICTORIA MEMORIAL.
—FIRST PREMATED DESIGN FOR HERFORD MUNICIPAL BUILDINGS.—OAK DOOR IN ECKEN MUSEUM.—FASHMORE EDWARDS' PUBL. LIBRARY, BOW.—WHITNEY ABBEY.

Our Illustrations.

QUEEN VICTORIA MEMORIAL, ST. JAMES'S PARK, S.W.

LAST week we gave the views of Mr. Aston Webb's selected design, with a brief review of all the schemes submitted. To-day we print a copy of Mr. Webb's plan, which we somewhat carefully described in our issue for August 2 last, when it was on private view at the Home Office. The complete character of this plan is its most distinguishing merit, and the circular court opening out of Whitehall most ingeniously brings the central axis of the Strand into harmony with that of the grand processional boulevard leading to the Palace. The oblique angle necessitated by the site has, by this simple expedient, been cleverly masked. However, the surrounding buildings thus to be brought into greater prominence by the opening up of this new circus unfortunately rank among the particular examples of recent architecture erected in London of which we have the least reason to be proud. The octagonal arrangement shown by Mr. Aston Webb at the bottom of the Duke of York's steps, in illustration of England's Eastern Dominions, India, and Africa, is an exceedingly happy feature of the plan, ingeniously connecting the roadways which branch off to the Horse Guards and to Storey's Gate with the Mall. It also terminates the side carriage roads in a neat and practical manner, while artistically the device is capable of a highly-satisfactory effect in execution with the aid of good statuary, of which we have far too little in London. The general view of the design, by Mr. P. G. Jackson, R.A., which we reproduce herewith, shows its aspect as seen from Buckingham Palace, looking right into the forecourt, set out in parallel lines, inclosing fountains and statuary arranged in an ornamental parterre, and representing India, Australia, South Africa, and Canada. The shadows cast by the colonnade show that its external face would be likewise used to a very happy mode of treatment. The author intended to thereby exclude noise, and the colonnade was to furnish a shelter from whence spectators might view the proceedings in the square on Grand occasions. Mr. Jackson also suggests that the flat roofs over could be likewise used to accommodate ticket-holders—as a sort of grand stand, we presume. The monumental arch at the end of the processional road is in itself a handsome and well-conceived piece of work, inclosing rich gates and handsome statuary with applied sculpture cleverly introduced, in illustration of the Jubilee processions of 1887 and 1897. Its position leaves the difficulty of dealing adequately with the opening into Whitehall undetermined; and if the scale of the perspective is correct, Mr. Jackson's archway must be exceedingly big in scale, seeing that the Duke of York's Column, elevated as it is many feet above the Mall by the steps out of the Park, is shown much lower, and quite unimportant in



QUEEN VICTORIA MEMORIAL.
(Plan of Mr. Aston Webb's Design.)

comparison.* Mr. Jackson's picture shows, too, that all the traffic from Constitution

* Since this was written we have been favoured by a copy of Mr. Jackson's report, in which he explains that he has made his archway 60ft. high by 40ft. wide. The height to the top of the cornice of the main order is 70ft., to the top of the attic 92ft., and to the top of the sculpture surmounting the whole 120ft. The Marble Arch is 24ft. 8in. high, the Wellington Arch 6ft. high, and the Arc de Triomphe, Paris, is 180ft. high. The Duke of York's Column is 124ft. high above Waterloo-place pavement, and the latter is from 12ft. to 15ft. above the level of the Mall.

Hill, going towards Westminster, must come between the Palace forecourt and the Queen's new statue, because the railings which divide off the carriage-drives from the central boulevard come right up to the gateway screen at the eastern end of this Continental-looking inclosure. The figures on the angle-pavilions are in bronze. Mr. Prentice's pen-and-ink view does not, of course, show the material; but the water-colour view, which Mr. Jackson made, illustrates an objection to bronze figures forming so essential a part in a stone composition. The Pavilions look better in true elevation than in perspective. Portland stone was proposed to be used throughout. Sir Thomas Drew's design, shown by a somewhat restless pen-and-ink perspective, of which we print a photolithograph, hardly realises the amount of continuous traffic to be provided for in the vicinity of Buckingham Palace, as we have already pointed out. This drawing emphasises this objection, which is made to appear the more serious by the closed gates at the end of Buckingham Palace-road and Constitution Hill. The picture displays the refacing of the Palace itself with its end wings and mansard roofs. The central point for the Queen's statue is fixed at 200 paces in advance of this new front and a circular plinth incloses the monument, without railings 300ft. in diameter. Although Mr. Brock's design for this part was a foregone conclusion, Sir Thomas Drew has designed a striking composition surmounted by Victoria standing looking up the Mall some 10 ft. from the ground. The ability displayed by the author of this design is unimpaired, exhibiting study and taste, as well as an appreciative knowledge of style.

FIRST PREMATED DESIGN'S HERFORD MUNICIPAL BUILDINGS.

This design, of which we give the elevations and plans, was placed first by the assessor, Mr. Thor. Blashill, F.R.I.B.A., in the recent competition for Municipal Buildings for the city of Hereford. In this scheme an attempt was made to comply with all the instructions, but at the same time to arrange the assembly hall so that it could be let for dances, theatres, &c., without disturbing the municipal business. The corridors have been arranged for extensions. The sum allowed by the council viz., £18,000, was carefully adhered to, and this affected the treatment of the elevation, which was kept as simple as possible. The materials suggested were Bath stone and red brick. The authors are Messrs. Macintosh and Newman, Birkbeck Bank Chambers, W.C. We published the design which was ultimately decided on by the Corporation in the BUILDING NEWS for August 9 last, and the design placed second appeared in our pages on August 23. It is interesting to be able to compare Mr. Blashill's choice of plan and elevation with those which found favour with the Town Council unaided by their professional referee.

OAK DOOR IN THE MUSEUM, ROSEN.
[FROM STUDENTSHIP DRAWINGS.]

THIS door, taken from a house in the vicinity and now in the Museum at Rosen, is one of many beautiful examples of the French Renaissance that are to be found in the galleries there. The officials in these museums seem to get the full value out of each individual work of art they possess, and in this instance the door, which was originally an outside one, is placed in the gallery which surrounds the museum and is at present into a very fine old stone doorway, with which it has, of course, no connection, but which serves as a natural frame to the woodwork of the door, which is delicately carved and skilfully moulded, as will be seen from the details.

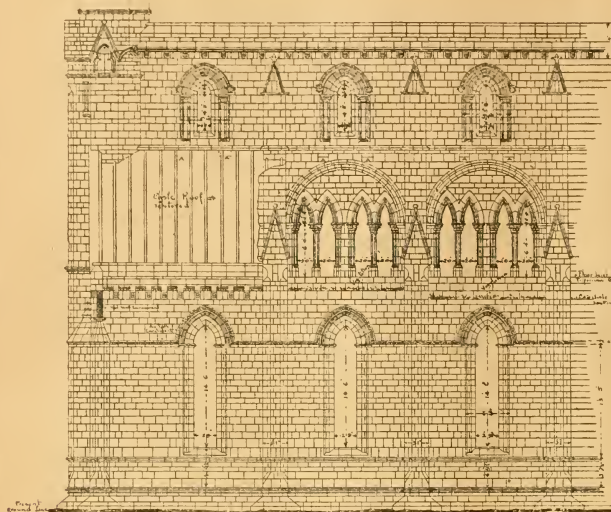
J. FORBES SMITH.

FASHMORE EDWARDS' LIBRARY, BOW, E.

THIS building is in the Roman road, Bow, opposite the public baths, on a corner site measuring 72ft. 6in. by 45ft., and is intended to serve as a branch library in the Poplar borough. For the protection of the building a high salt-glazed brick base is provided, the materials above being Portland stone and red bricks. The construction throughout is fire-resisting. Messrs. Kingerler and Sons, of Oxford, have erected the building, at a cost of about £5,000, from the designs and under the superintendence of Mr. S. B. Russell, architect, 11, Gray's Inn-square, W.C.

WHITNEY ABBEY, YORKSHIRE.

For description see page 618.

WHIGBY
CHOIR

NOTE

The hatched portion ~
of the plan indicates
Early English work

The part edged on
plan indicates decorated
work

The portion uncoloured
is now destroyed

The plan shows the
Abbey as existing in 1894

The west front presents
an air of the perpendicular
period, but is much
decayed

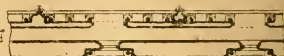
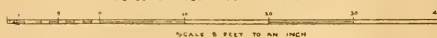
The parts of the ~
Herring have been
measured and plotted
on the site

The portions shown
in black on plan have
only the foundations
remaining

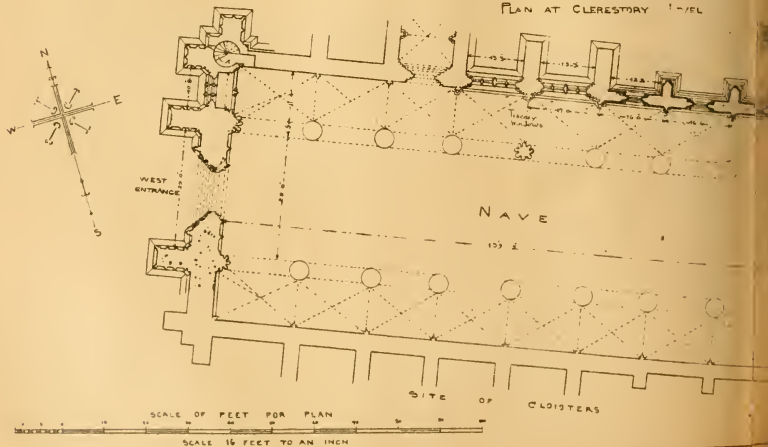
The letters A A on
external elevation denote
stone Corbels which
supported wall plates for
Vaulted Roof timbers

EXTERIOR ELEVATION LOOKING SOUTH
[ALONG LINE B B]

SCALE OF FEET FOR ELEVATIONS



PLAN AT CLERESTORY 1"=5'



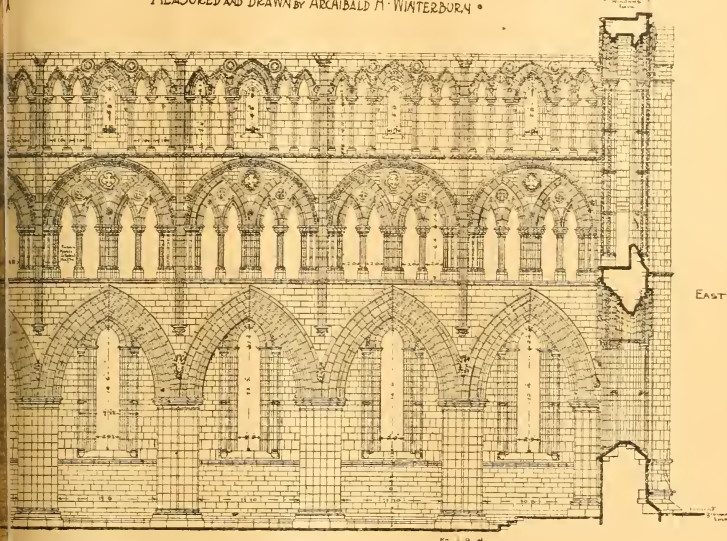
SCALE OF FEET FOR PLAN

SCALE 16 FEET TO AN INCH

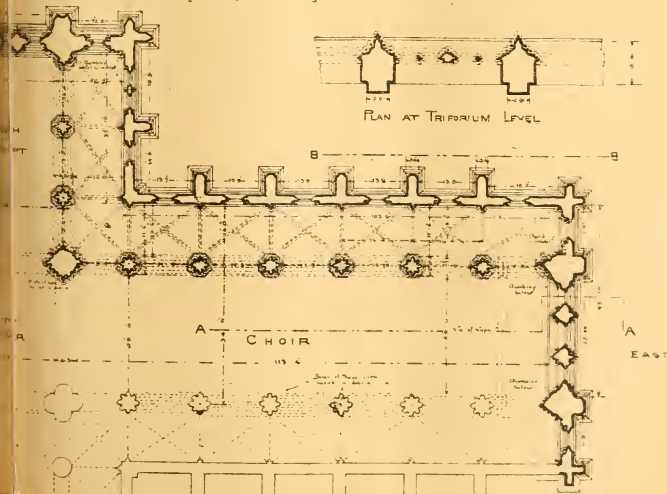
YORKSHIRE

bing

• MEASURED AND DRAWN BY ARCHAIBALD H. WINTERBURN •



INTERIOR ELEVATION LOOKING NORTH
[ALONG LINE A A.]



GROUND PLAN
[AS IN A.D. 1874]

destroyed by the
[fire of the tower]

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the *Building News*, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is frequently occasioned by the loss of drawings, and our communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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RECEIVED.—J. A. S. and Co.—H. M. M.—D. and Co.—D. W. H.

H. LANGTON COLE.—The name of the patentee is F. M. David, 27, Billiter-buildings, Billiter-street, London, E.C.

Correspondence.

NEW COWL TESTS.

To the Editor of the *Building News*.

SIR, I am decidedly of Mr. Bibby's opinion—as I feel sure most people would be who were acquainted with the facts of this regrettable affair—that so far as these tests are concerned "it would have been kinder to the memory of Mr. Rogers Field if they had been left in oblivion." The Council of the Sanitary Institute have incurred a very grave responsibility in issuing a report of such a character, and have only themselves to blame for the ridicule they have brought upon the Institute and the hard things that are said about it in the Press, which seems unanimous in condemning the report as more likely to prove a danger than a benefit to the community. These criticisms must prove a source of genuine grief to all well-wishers of the Institute, as they cannot but recognize their justness. The Council have much to answer for in respect to this report, which might have proved seriously misleading had Professor Shaw, who edited it, not saved the situation by his timely warning in his admirable preface.

I observe that the *Illustration*, referring to the "pre-historic" character of the report, says,

"Time waits for no man, not even for the Council of the Sanitary Institute. . . . The science of ventilation by means of cowls has progressed so much since the days when the use of the old varieties of cowls used in the experiments have become obsolete. . . . We cannot help feeling that a report dealing with cowls and ventilators long since consigned to the scrap-heap and the splinter-pot should not be taken seriously, although, of course, its antiquarian value need not be disputed."

Another contemporary follows on:—"There are important considerations as to the appliances used in the experiments it might be supposed that invention was to remain inactive until the report was published. . . . From the position acquired by the Sanitary Institute we expected a volume of a different quality."

A society such as the Sanitary Institute cannot afford to become a laughingstock and a gibe.

There is a still more serious side to this matter, as the Council must have known very well that these cowl tests formed almost a "craze" with Mr. Rogers Field, which was accentuated when the first instalment of the report on the tests was condemned by the *Times*, which said: "The method of testing was incorrect, and therefore the tests are valueless. Neither in the case of either of the cowls or the tubes was their true value as extenuated or exaggerated" ("this opinion being endorsed by other sections of the Press, and by the leading authorities).

It is well known that those who were personally acquainted with Mr. Field that this "craze" developed in intensity during the latter part of his life until it culminated so sadly, and considering the painful circumstances, which finally resulted in his hapless tests to a cowl test, I think, have shown a true regard for the memory of their departed colleague, who, notwithstanding his eccentricity in regard to cowls, was an enthusiastic and indefatigable worker as a sanitary engineer, if the Council had refrained from publishing this report. The memory of Mr. Field as an earnest worker in the interests of the Institute surely deserved a worthier recognition than the Council have bestowed upon it by their ill-advised action in drawing public attention to these unfortunate tests over which a merciful veil of oblivion should rather have been drawn. No one who knew Mr. Field could doubt the integrity of his purpose, and if he made mistakes they were made in an honest endeavour to advance a good cause, and this should always be remembered to his credit, and it therefore seems rather "hard lines" that the Council of the Sanitary Institute should so gratuitously go out of their way to place these mistakes on record. It seems a somewhat ungrateful return for the £2,000 Mr. Field expended on these tests, and the £5,000 he left to the Institute, and such a proceeding is not likely to bring in the £25,000 asked for by the Institute to provide further "memorials" for the Cowl Committee. A perusal of the report can only excite feelings of astonishment and commiseration in the minds of those acquainted with the facts, particularly after reading Professor Shaw's condemnation of the conclusions to which they arrived, and the approval of the methods by which they were attained. As the methods adopted by Mr. Field when making the tests constituted simple errors of judgment arising from an insufficient acquaintance with the subject and its requirements, I cannot understand why the Council should have caused such haste to advertise this lack of knowledge, and to assume a false position as to Mr. Field's reputation as an authority on ventilators is concerned. The Council have certainly original notions as to what constitutes a "memorial," and I am thankful that I am not a prominent member of the Sanitary Institute. In publishing the report they have moreover displayed a reckless disregard of consequences highly reprehensible, and such proceedings as this are a conservation of health. If the Council had possessed the slightest foresight they should have known that a report such as this one is would be subjected to the severest criticism, and that the real value of the tests would be made apparent, and it is inconceivable how they could be so prominently allowed to assume a false position, and afterwards publishing the report when they must have known, from Professor Shaw's investigations, that the tests, for all practical purposes, were valueless, and could only prove misleading and harmful.

Though a self-constituted authority on questions of hygiene, the Sanitary Institute is not an irreproachable body, and the sacred trust it took

upon itself to assume should be jealously guarded and not abused to the detriment of the public health. The Institute has added to its prestige by its present deliberate display of bad judgment. On the contrary, after what has occurred public confidence in it as a reliable guide may be somewhat shaken, and were that confidence once forfeited it would be no easy matter to secure it again, when the Sanitary Institute as a useful body would virtually cease to exist. The Institute should really turn over a new leaf: it has done so much good work in the past, and it will still more in the future; but it must abstain from making such fatuous attempts to pose as an authority upon a subject which it is clear from the report it knows very little about. Apropos of this, the *Public Health Engineer* says: "It does not appear that the experiments were conducted with much scientific method. . . . It is doubtful whether the best interests of the Institute have been served by the publication of this report. . . . We cannot help thinking that the whole business is very instructive. It shows us how dangerous it is for any private body like the Sanitary Institute to intrust to private individuals the conduct of important experiments of the kind in which they are engaged. . . . It is doubtful whether the public interest, that experiments of this character should be removed from the region of professional jealousy and commercial discrimination. They should be conducted by a Royal Commission whenever possible. They should be intrusted to men of pure science—not to men whose daily practice must bring them in contact with the commercial world. . . . If they have been appointed to investigate, and, moreover, they should be conducted under proper control and in a methodical and scientific spirit, otherwise, we fear that they may often result in a great deal of labour with very little practical benefit, a great deal of rancour and controversy, and no permanent scientific gain."

I see that Mr. Pridmore refers as follows to the gravest nature of all in connection with the report, if true:—"I note that you inquire if the terminal which, according to the report, proved the most efficient though Mr. Shaw does not endorse this conclusion—is the property of the Sanitary Institute, and if the Institute holds a patent for it. As the point is an important one, I certainly think that the Sanitary Institute, in its own interests, should not allow it to go unmentioned, as otherwise misconceptions might arise prejudicial to the Institute." As this is a distinct challenge to the Council of the Institute, it remains to be seen whether they will reply to it or not. A Society like the Sanitary Institute, should, like Caesar's wife, be "above suspicion."

I am, &c.,

Victoria, Milford, November 4, 1901.

A memorial window to the memory of the late Rev. Brooke Lambert, for twenty years vicar of Greenwich, was unveiled on Sunday at St. Alphage Church, Greenwich. It represents the patron saint of the church. At the same time a brass font cover, also in memory of the vicar, was dedicated.

The Leeds City Tramways are shortly to be extended to the boundary at Thwaite Gate, along Whitehall-road and Elland-road to the city boundary, and from the terminus at Whitehall-road to Whitehall-road, near New Blackpool.

The new joint dock at Hull, to be constructed by the North-Eastern and Hull and Barnsley Railway Companies, is now so far advanced that the plans have been approved by the joint committee of directors, and the tenders for the construction of the dock are expected to be taken next week. The dock and equipments will be about £1,400,000.

Boote Town Council have unanimously appointed as electric engineer Mr. T. Dawson Clothier, who is at present chief assistant to the electric engineer of Hull Corporation, at a salary of £1,000.

It has been decided to restore and relapse the heavy pediment in Exeter Cathedral. The work will be carried out by Messrs. Taylor and Co., of Loughborough, at a cost of £1,100, towards which more than one-half is in hand.

Through the generosity of the Marquis of Zetland a Cambridge quarter-chiming clock is to be erected in the parish church, Marseby-by-the-Sea, by Messrs. Wainwright and Sons, of Leeds.

In commemoration of Queen Victoria, the great bell of six bells in Lymington parish church have been recast, and a new tenor and octave added. The work has been carried out by Messrs. John Taylor and Co., of Loughborough, and the new peal of eight was rung on Sunday.

Intercommunication

QUESTIONS

1189C. — **Street Improvements.**—A municipal corporation proceeds through its contractor to pull down buildings acquired under Parliamentary powers in an important thoroughfare for street improvement purposes and to erect a new building on the site. The premises have suffered considerable inconvenience and loss by interruption of his business, etc., consequent upon the accumulations of refuse materials, dust, noise, and other annoyances attendant upon the operations of the contractor or mitigated had the authorities taken requisite precautions. The exposure and damage to the party-wall has destroyed the comfort of some of the rooms, and fear of an accident may cause the party to vacate the premises. Can any remedy, state or municipal, be claimed there is for compensation to tenant and landlord for such disturbance? Any reference to records or reports of the Corporation of London, or of documents of interest to many others similarly situated?—*See 686.*

REPLIES

[11800].—**Stole.**—Mr. John T. Rea's former statement is partially correct. The second is evidently a misprint which he intended to read like the first. Personally, I consider there is 75 per cent. more work in Devonshire granite than in Portland stone. Portland is always sawn. Granite is only rarely sawn in Devonshire; but it is common so to cut it in Aberdeenshire.—**HARRY HEWES.**

1150. **Steve.**—I am afraid "Gee, how have you studied very closely my table of labours on stone given in issue of July 5, centre column of page 5. In this I stated that the weight of the Bath was 40 per cent, less than that on Portland, then I said that the weight was 33 per cent, more than Portland. Following this, the Editor said, "You are a little bit off." Look at it, and you will see that I am right. The weight of the stone is, as closely, as the small print in the issue, 100 lbs. per cubic foot. Yes! Portland stone is really saved with a mason's transverse, which is a long, thin, steel blade, without teeth, and is used by two men, one man, standing on the stone, worked backwards and forwards by two men, clean, sharp, and water being used to facilitate the operation. The pneumatic chisel, and the rotary cutter in lathe have practically revolutionised the business. The various tools used in dressing, scabbling, punching, picking, bushing or bush-hammering, both axing, axing single, five, and patent, and the various tools used in plain work, is a long list. I do not generally apply to granite, and also the appliances have come into operation there is no reason to

11801. — **Exam. for Inspectors of Nuisances.** H. A. Knight, author. "The most essential books to obtain for the purpose of recommending 'Practical Sanitation,' by Dr. Reid, published by Griffin and Co., price is; also a 'Practical Guide for Inspectors of Nuisances,' published by Knight and Co., price 2s. 6d. As the day of examination draws near, be should consult 'The Questions for Examination of Sanitary Inspectors,' published by the proprietors of the *Sanitary Record*, price 2s. These three books give all the information 'in a nutshell,' and any sanitarian should be able to pass with the aid of them, especially if he is conversant professionally, with sanitary works." Assoc. Secs. INSL

The death has just taken place at Douglas of Mr. Thomas Skillecorn, a centenarian working mason. Mr. Skillecorn was born near Laxey, Isle of Man, in 1801. He was hale and active up to quite lately, and within the last decade he, his son, his grandson, and his great-grandson, all of them being masons, worked together at one time on a job in Douglas, which is in itself remarkable.

The acquisition by the promoters of the Baker-street and Waterloo Underground Electric Railway of the premises that hitherto have been used as a school for the Indigent Blind, in St. George's-circus, Southwark, renders it necessary to remove that institution, which is one of the oldest of its kind, having been founded so far back as 1799. A site for new schools has been found at Leatherhead, and Princess Christian will lay the foundation-stone on Wednesday next.

Mr. A. A. G. Malet, an inspector of the Local Government Board, conducted at Colwyn Bay, on Friday, an inquiry in reference to the application of the urban district council for powers to borrow £60,000 for sewerage, to be carried out from plans by Mr. Green and Mr. Baldwin Latham, £14,860 for sea-defence and promenade extension purposes, £8,450 for electric light extensions, £1,500 for a cow's yard depot and mortuary, and £1,000 for the construction of tar-paved footpaths.

Presiding on Tuesday night in the Picton Lecture Hall, Liverpool, on the occasion of a lecture on "English Cathedrals," by Mr. W. H. Hooper, Sir William Forwood said he knew the listeners took a great interest in their new cathedral, and he hoped day by day they would take a deeper interest. They had the most magnificent site in England, for he felt convinced there was not a site in the country so approaching that of the cathedral as this. He named for the architects of England to show a design worthy of that site, and he had no doubt they would have some magnificent designs produced, and that before many years were past they would have the beginnings of a cathedral of which they in Liverpool would be proud, and all England would be proud.

LEGAL INTELLIGENCE.

AN ARCHITECT, A TITANIC SLENDER, CRIMINALS, AND A TOWN COUNCILLOR FOR HOVE, N. BRIGHTON, WERE THE PRINCIPAL ACTORS IN THE CASE OPENED FOR THE PLAINTIFF, SAID THAT ON OCTOBER LAST both the plaintiff and defendant were directors of the Brighton, Worthing, and South Coast Steamship Company, of which Col. Hancock was chairman. The plaintiff had previously purchased 100 shares of the company at 12s. 6d. each, and afterwards he offered them to Mr. H. Head, of the Royal Southampton Yacht Club, a member of the directors of the company. The company was held on October 1st, and after the business had been disposed of the defendant, who had been on bad terms with the plaintiff, stated: "I have no personal charge to bring against one of the directors of this company, but I have a charge against the day, whereby the interests of this company are being seriously damaged. It is that of immoral trafficking in the company's shares, and thus the company is being run in a very serious manner, to the detriment of the company." The plaintiff and defendant indicated that the plaintiff was a person to whom he was referring. There was no justification for the charge, and plaintiff could not show that the defendant had been guilty of anything really required was a written allegation to show that there was no truth in the allegation. Plaintiff was called, and bore out the opening statement of the plaintiff. On cross-examination, plaintiff denied that he had endeavoured to purchase the shares of Captain Lee at 10s. each. His clerk might have tried to purchase them, but not for him. He knew that a good deal of the company's capital remained in the hands of the directors, and that the shares which he purchased, because he thought it was possible he should pass them into the hands of his son and not with the intention of keeping his name in the records of the plaintiff's case, Mr. Lewis Glynn, K. C. The plaintiff then called Mr. Head, who to the jury. The occasion was specially privileged. Mr. Justice Wills: I do not see anything illegal or immoral in what the plaintiff did. Mr. Glynn argued that the defendant had been guilty of a tort, and that the occasion was privileged, and that there was no evidence of malice. Mr. Rawlinson contended that the words were actionable, having been spoken of the plaintiff in relation to his office as director of the company. The plaintiff then called Mr. Head, who was specially privileged, and asked the jury whether in their opinion there was any evidence of malice. The jury found there was no malice. Mr. Justice Wills then entered a judgment for the defendant with costs.

NO ARCHITECT.—An inquest was held by Mr. M. Roberts-Jones, coroner for South Monmouthshire, at St. Mellons, near Cardiff, on Saturday respecting two deaths which occurred through the use of a defective iron rod. Dr. Drudstone, which was being erected for Mr. Henry Jones, a well-known breeder of hunters. The deceased were Alfred Pearce, a carpenter, and Augustus Spooner, carpenter's apprentice, besides whom several persons were present. The cause of the deaths was that the erect was engaged. It was originally intended to have a wooden frame, but iron was substituted, and it would not have such a clumsy appearance. The accident occurred on Saturday last, and it is not clear how the disaster happened, but after hearing expert evidence the jury found that the deceased died from injuries sustained through the fall of the rod, due to the fact that the iron rods were not being used in the proper manner. The coroner, however, thought, showed a lack of engineering knowledge.

RE C. G. CROWDEN.—An adjourned first meeting of creditors was held on Monday, before Mr. W. H. Bowyer, assistant Receiver, under the influence of Charles George Crowden, builder and contractor, of Westbourne Bridge Wharf, Paddington. A proposal providing for the payment of a composition of 10s. in the pound to the creditors, claims for £48,261 being withdrawn, was not accepted by the meeting, and a resolution for bankruptcy was accordingly passed. Mr. F. W. Davis, chartered accountant, was nominated as trustee to superintend the estate, and Messrs. B. J. B. & Co., solicitors, were appointed liquidators. The debtor returned his liabilities at £48,981, of which £4,952 was expected to rank, and estimated assets £13,969.

IN RE VEALE AND CARTER.—A first meeting of creditors was held, on Wednesday, before Mr. C. A. Pope, under the failure of George Veale and George Carter, builders, lately carrying on business under the style of Veale and Carter, at 45, Mill-lane, Brixton-hill, S.W. It appeared from the statements of the debtor Veale that he had failed on four previous occasions, and was undischarged from his last bankruptcy, which occurred in 1898. Shortly after that failure he recommenced business.

and in March, 1900, he was joined in partnership by the debtor Carter, who was an army pensioner and had no experience in the business. The debtors attributed their insolvency to having entered into contracts without possessing sufficient capital to carry them through. Accounts had been filed showing liabilities \$2,340.85, 9d., and an estimated surplus in assets of £113 3s. 5d. A chartered accountant was appointed as trustee of the estate, with a committee of inspection.

CHIPS.

Dudley parish church has recently been renovated, the electric light installed, and the fine old organ reconstructed by Messrs. Ingram, Hope-Jones, and Co., the outlay being £1,850.

On Saturday the Bishop of Islington laid the foundation-stone of the new church of St. Aldhelm, Edmonton. For many years past an iron church has stood on the site, but at last, by the aid of the Ecclesiastical Commissioners, this is to be replaced by a permanent building.

On All Saints' Eve the Bishop of Stepney unveiled two stained-glass windows at All Saints' Church, Buxton-street, E. One window has two lights—the subject of one being "I was thirsty and ye gave Me drink," and that of the other "I was sick and ye visited Me." The other window depicts the Carpenter's shop at Nazareth. Both are the work of Messrs. Clifton and Taylor, of Berners-street, W.

Owing to the opposition of Harrow School, the Middlesex County Council tramway scheme from Wembley to Harrow was rejected on Wednesday by the Light Railways Commission. The Commission also rejected the Colindale to Harrow, viâ Willesden, scheme. The Kilburn High-road scheme was rejected, and the Harrow to Edgware system also, except one mile from Stanmore to Edgware. The only remaining pieces of the intended great circular system granted were:—Willesden to Wembley, 2 miles; and Harlesden to Acton, 21 miles; in all 51 miles granted.

At the Clitter Assizes, on Friday, before Mr. Justice Phillimore, three brothers, named Edwin, George, and William Kenyon, who carry on a rope factory at Dukinfield, and Joseph Taylor, a building contractor, were charged with the offence of reverently and indecently disturbing human remains in a Roman Catholic burying-ground at Dukinfield. It was stated that the Kenyons had erected an obelisk on the site of the remains in a new burying-ground, and when preparing the site human remains were subjected to shocking indignities. The three brothers Kenyon were each bound over in their own recognizances to the next Assizes to keep the ground level and smooth, and to leave the remains undisturbed. The jury returned a verdict of guilty, and Edwin Kenyon, in addition, was sentenced to two months' imprisonment in the first class; while Joseph Taylor was sentenced to one month's imprisonment, also in the first class.

Mr. A. McMorance, Chairman of the London County Council, unveiled, on Wednesday, a memorial to the late Sir Joseph Bazalgette, for many years Engineer-in-Chief to the Metropolitan Board of Works, and the first of the great drainage engineers of the country. The monument is a large, dark, polished granite, and is placed on a high, rectangular, granite base, which is the work of the sculptor, Mr. John Birnie Philip. The monument is a large, dark, polished granite, and is placed on a high, rectangular, granite base, which is the work of the sculptor, Mr. John Birnie Philip. The monument is a large, dark, polished granite, and is placed on a high, rectangular, granite base, which is the work of the sculptor, Mr. John Birnie Philip.

Tenders for the constructional work for the widening of London Bridge will be invited in a few weeks' time; but it is improbable that any decision respecting them will be arrived at until the end of January. Within a week of the acceptance of a tender work will be commenced. The footbridge will be thrown across the Thames by about May or June, and the completed bridge will be opened, it is anticipated, about January, 1904.

It has been decided that the replica of the statue of the late Mr. John Bright in the Art Gallery at Birmingham which Mr. Bruce-Joy is making for the Houses of Parliament shall be placed in the Lower Waiting Hall, near the Grand Committee staircase, on which stands Foley's statue of Sir Charles Barry, the architect of the New Palace of Westminster. The bust of Cromwell already stands in the Lower Waiting Hall.

With reference to the application of the Neston and Parkgate Urban District Council to the Local Government Board for sanction to borrow £7,423 for the purposes of sewerage and sewage disposal, Mr. A. A. G. Malet, A.M.I.C.E., Local Government Board inspector, held a public inquiry at the town-hall, Neston, last week.

Our Office Table.

CONSIDERING with the opening of the new session by the inaugural address of Mr. W. Emerson, the President, as reported elsewhere, the *Kalendar* of the R.I.B.A. has just been issued. Like other publications of its class, it shows a tendency to increase in bulk year by year, and now reaches 316 pages against 326 in 1900. The roll of membership comprises 617 Fellows, 11 Fellows-in-training, 1,021 Associates, 10 Hon. Fellows, 47 Hon. Associates, and 63 Hon. Corresponding Members, or a total of 1,772, in addition to 413 students. Last year the Fellows numbered 615, the retired Fellows 9, Hon. Fellows 9, the Associates 1,001, the Hon. Associates 47, and Hon. Corresponding Members 63, or a total of 1,765, the increase being as usual almost solely in the class of Associates, and the students then numbered 373, showing an increase in that class this year of forty.

THE REV. C. H. V. PINELL, vicar of St. Faith's Stoke Newington, writes that it has been suggested by several persons that some memorial should be raised to the late Mr. James Brooks, F.R.I.B.A., for the valuable services he has rendered to the Church at large by many of his ecclesiastical buildings. Mr. Brooks for the last twelve years lived with one single intermission, acted as churchwarden of St. Faith's. Before my time he completed the western portion of the church on his own responsibility, and the remaining debt on the building due to him was only cleared off in the second year of my incumbency. Since that time, under his direction or that of his son, Mr. J. Martin Brooks, numerous additions and improvements have been made in the fabric of the church, e.g., porch and vestries, &c., and at the time of his death he was much interested in the Lady-chapel his own creation, which is now very nearly completed. St. Faith's seems, from his close connection with it, to be the place for the memorial, and several objects have been mentioned as suitable. The nature of the memorial must, however, depend upon the amount of subscriptions received. I should be glad to receive suggestions as to what the memorial should be; but I would rather leave the ultimate selection to the members of Mr. Brooks's own family.

SIR W. B. RICHMOND, R.A., pleads for the sum of £1,500 needed to save Hogarth's House at Chiswick from the builders. The house, which, failing a private purchaser, will be offered at auction on Monday, the 25th inst., is Sir William's own house, and is, historically interesting; in it Hogarth painted many of his most famous pictures and executed his best engravings. The professor's suggestion is that the Chiswick Council shall subscribe £1,500, and that the County Council shall represent the feeling of Londoners towards the art of the greatest satirist in paint that probably any country has produced by adding to that sum £150. Hogarth's name will never die; being a great moralist, he was also a great painter, remarkable in a time when Reynolds's and Gainsborough's aristocratic art was taking the town by storm. Hogarth's originality, his persistency, and his greatness as a painter are well known: £1,500 is not much to ask for, so that the house, and its name, and the land, as it is not only by our own countrymen, but by Americans, colonials, and foreigners, should be preserved, put in order, and respected.

THE collections in the Corporation Art Galleries at Glasgow, already of great value, have recently been augmented in importance and interest by a very large number of donations and bequests. The donations include oil-paintings by Colin Hunter, J. S. Cooper, A. Monticelli, David Fairbairn, D. O'Hill, Von der Heyden, Gerard De Witt, and W. B. Yeats, and examples of water-colours by such masters as J. W. M. Turner, George Catermole, David Cox, David Roberts, Geo. Barrett, Josef Israels, G. F. Sargent, W. L. Litch, T. M. Richardson, Sam Bough, W. Carrow, and many others, including well-known Scottish artists.

A SPECIAL committee of the town council of Huddersfield have been sitting to investigate charges arising out of municipal administrations, chiefly referring to the late Mr. James Brooks, an architect and surveyor, and Mr. Harman, the town engineer. The committee's report has just been published, and completely exonerates both Aldermen Brooks and Mr. Harman. It had been

complained of that Mr. J. A. Stocks, a brother of Ald. B. Stocks, had been employed by the Gas and Electric Lighting Committee of the Huddersfield Corporation to get out quantities for work in connection with the construction of the electric light works and the reconstruction of the gasworks, and that either Ald. Stocks or his brother, or both, received commissions upon a sum of about £100,000 in connection with this work. The committee find that there was no secrecy or concealment in any way in the appointment of Mr. J. A. Stocks on any of these commissions, and that his appointment had the entire approval of the respective committees and of the council. The total value of the work certified by Mr. J. A. Stocks was £37,926, and his remuneration £329, or about 0.86 per cent. They further find that Mr. J. A. Stocks was, during the whole of the period between 1889 and 1895 when the work complained of was done, employed in the office of Ald. Stocks as an architect and surveyor, but they are satisfied that most of the work was done by him out of business hours. The committee find that, should the town receive any portion of the money paid to Mr. J. A. Stocks, either by the corporation or the contractors, and either as commission or otherwise, but that it was all used by Mr. J. A. Stocks solely for his own purposes.

It was also alleged that Mr. Harman, the gas engineer, had a secretaire made out of material belonging to the corporation by workmen in the employment of the corporation for his own use at his private residence, without paying for such material or labour; and, further, that Mr. Harman had an asphalt walk made at his residence on the same terms and in a similar manner as in the case of the secretaire. The committee find there is absolutely no justification for the charges. The secretaire in question is the property of the corporation, and not of Mr. Harman, and was made by the instructions of the gas committee for official use. The asphalt complained of was purchased by Mr. Harman at its full value in the ordinary course of business, and all work done in connection with the laying of this asphalt was duly paid for. It was also stated that coals have at various times been supplied to Ald. Stocks and other members of the council from the gas works at a less price than they could have been obtained from private coal merchants in the town by other members of the council. The committee find that coal had been sold to Ald. Stocks, and also to the borough surveyor; but in every single case the coal had been paid for, and the corporation have made a substantial profit on it. At the same time, the committee are of opinion that it is undesirable for the gas committee to trade in house coal, except merely for the purpose of supplying other departments of the corporation, and recommend that the practice should be discontinued.

ALTERATIONS at present being carried out to property abutting on the Mead Market, Hexham, have been the means of throwing additional light on the three old churches of Hexham, namely, St. Mary's. This church was erected a little later than the Abbey Church, somewhat about the year 1200. The foundation of the east end of St. Mary's is underneath the Cumberland Union Bank, having been discovered when that building was erected. The western bay of the nave has just been revealed in the pulling down of the eastern end of the tower, which is on the south side of the nave. Many years ago, when Mr. Ellis built some property at the foot of Beaumont-street, the corresponding arch on the north side of the nave was discovered, though it was not then known that it was the western bay of the nave. It is hoped that the further course of the work may reveal whether or not this church had a western tower. So far as is known, it consisted of a chancel, nave, and north and south aisles. Roughly speaking, it was about 100ft. long. Probably it was dissolved when the dissolution of the monasteries, when the Abbey Church came to be used as the parish church. Little is known in history respecting this church. The foundations of columns and other remains have been seen during the process of alterations to property in the Market-place and Mead Market, but never on such an extensive scale as on the present occasion. The style of the work is Early English of a very plain character; it was not nearly so ornate as the Abbey Church. A capital of the western column of the bay has, through the kindness of Mr. Wailes, miller, been taken from the Abbey Church for preservation. There was formerly a third church in Hexham dedicated to St. Peter, the site of which is now known.

"ELECTRICITY WORKS LOAD FACTORS" were described by Mr. J. Gray Scott, the borough electrical engineer to Leith Corporation, in a paper read before the Glasgow Technical College Scientific Society on Saturday evening, Mr. C. P. Hogg, M.Inst.C.E., President of the society, occupied the chair. Mr. Scott explained the meaning of the term "load factors," its importance in the generation of electricity, and the various uses to which it might be applied, and described the maximum demand system of charging which is based on this principle, and also referred to the various other systems of charging which are in vogue in other towns. He maintained that, in consequence of the fact that in use, it should be employed throughout, and deprecated the introduction of alternative systems of charging, and further urged that where employed the maximum and minimum charges should be adjusted to correspond with the capital and running costs of the undertaking. The system of charging in use at Leith, he said, was the maximum demand system, and that system was perfect, that one had a number of advantages. Thereafter he treated load factors accruing to the various classes of consumers, and pointed out the advantage to an electricity works of a tramway supply. The load factor of an electric tramway would be about 60 per cent., and would, of course, increase the load factor of the plant provided in consequence of its favourable effect on the load factor of the load. Cable tramways had a similar load factor, but unfortunately it was what one might term a dead load factor.

MESSRS. ROBERT BOYLE AND SON, Ltd., of 64, Holborn Viaduct, E.C., and Glasgow, have issued four new sectional catalogues, which will be found most useful by architects and builders by reason of the excellent way in which their subject-matter is subdivided. The first deals with the well-known air-tight pump ventilator and ventilating appliances generally, the next graphically illustrates the application of natural ventilation to churches and schools; the third is more particularly devoted to school ventilation, and the last deals with the natural ventilation of hospitals and asylums. The pre-eminence of the Boyle system and the favour with which it has been received by all classes of architects and builders is further reflected in the fact that there is so much that is worth study in the four handbooks that no architect or builder desirous of keeping himself thoroughly abreast of the latest information about natural ventilation can afford to be without them.

CHIPS.

On Saturday afternoon the foundation-stone of the new church, St. Barnabas, in Goldsmith-lane, Jesmond, was laid by the Bishop of Newcastle.

York Corporation have approved of the recommendations of the streets committee to apply to Parliament in the next session for powers to reconstruct the existing tramways, and to lay down new lines. The proposed traction system is electricity.

MR. R. H. BICKWELL, M.L.C.E., Local Government Board Inspector, held an inquiry at West Hartlepool on Tuesday respecting the application of the corporation for sanction to borrow £31,331. The chief items making up the total were £12,000 for a new sewerage works at Foggy Furze, £12,200 for sewerage works, £12,419 for street construction and improvements, &c., £7,337 for the provision of an open space, £504 for allotment purposes, and £2,000 for purposes of electric lighting.

An obelisk is about to be erected on College Green, Bristol, at the cost of Mr. Alfred Mosely, C.M.G., as a memorial to the officers and men of land regiments who have fallen in the Boer campaign. The obelisk, designed by Mr. F. W. Marks, architect, of London, to be of Swedish red granite on a base of green granite. Cancroed bronze tablets on the four sides of the base will be noticeable parts of the design, and there will be smaller tablets containing the names of engagements in which soldiers from the three counties took part. The obelisk will be 100ft. high, and will be built on a level of the top of the hill will occupy an area of 15ft. square. The memorial will cost £1,000.

At Rhyl, on Friday, Mr. A. A. Malet, one of the Local Government Board inspectors, held a public inquiry as to the council's application to borrow £57,000 on sea-defence works, and to promenade extension, &c. There was no opposition to the proposal, and the town clerk stated that the council intended carrying out a large scheme of sea-defence works in the east end of the town, on a scale similar to that carried out in the west end, where the town had spent £17,000 during the past few years, and private owners had contributed £3,000.





GROUND FLOOR

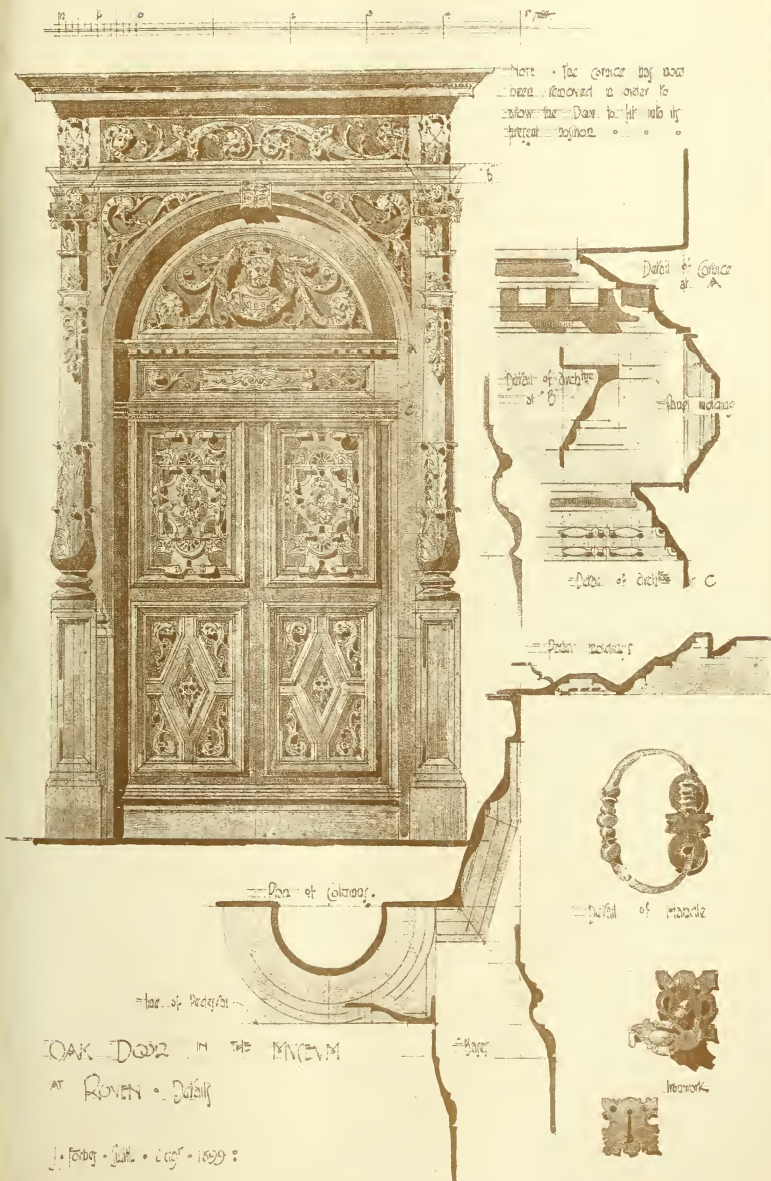


FIRST FLOOR



2ND FLOOR





"PHOTO-TIME" by James Akerman 8 Queen Square London W.C.



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PLANNING A FACTOR IN FIRE PREVENTION.

DIRECT means of prevention are not always the most efficient course to adopt. If a building is exposed to excessive floor-*wear* it may, for instance, be more effective to so arrange its plan or entrances that the surfaces exposed are small than to make the whole floor of adamant; so also in a building exposed to the risk of fire it is not always safe to rely exclusively on the fire-resisting qualities of its materials, but to try and compass the same ends by means which, though less direct, are often more efficient. Thousands of persons have been sacrificed in buildings that have been constructed with every resource to fireproof properties, so also valuable property has been destroyed in structures built with the latest fire-resisting floors and walls. Lately, when remarking on the new regulations issued by the L.C.C. for the safety of theatres, we hinted that planning of these places of public resort was a vital question to be considered, and in the discussion that took place at the Criterion Restaurant before members of the "Old Players" Mr. Mr. Edwin O. Sachs expressed the same view. He said that good planning in the arrangement of theatres is of more importance than the use of fireproof materials; any system of surprise inspections, he also thought the County Council should have power, and that these questions should be less subject to the fluctuation of opinion and change of election of that body, and be left more in the hands of the superintending architect; that local authorities should be relieved of their responsibilities as regards theatre construction, which should be controlled by a Government department. The majority of theatre managers considered that authority should be vested in the Lord Chamberlain. The vacillation of the L.C.C. in the requirements of theatres has unquestionably offended the managers of these buildings, and have given room for evasions on the part of the architects, and in violation of the by-laws. But it is not only in respect of theatres that the question of planning applies. The erection of lofty city warehouses, blocks of offices, and dwellings in flats suffers from the want of a well-devised code of rules that shall apply not merely to the construction of walls and floors, but the means of escape in the case of fire. The positions of entrances and exits, of staircases, and the position of fire-doors, trap-doors, means of confining the inflammable contents, methods of extinguishing fire are left to the builder. The Building Act gives general rules for the construction of party-walls, floor landings, staircases, chimneys, and other details; but a great deal is left to the architect or building owner, or the decision of the Council and their officials. The consequence of this want of definite rule or instruction is that some vital points in the arrangement of buildings are overlooked. Although the most perfect system of fireproof construction may be adopted, we find a plan that almost invites the spread of flames; large areas subdivided by partitions of the most vulnerable kind, or in which the fittings are of a very inflammable nature, staircases and well-holes in the centre of large masses of combustible materials, long narrow passages on the upper floors, without any means of escape, and an arrangement of entrances that can be quickly impeded or obstructed in case of a panic amongst the employees. Of what value is the most fire-

resisting floor, if exposed staircases and lifts remain unprotected? Or can there be any safety, if corridors are perfectly unimpeded by the use of partitions of the most unimpedable resistance, if smoke can pour into them from below, and there is no means of escape at the further end from the staircase or lift (they then become death-traps); or if the corridors and passages are so tortuous that few can find their way out of a burning building? So a most invulnerable fireproof door, if it is placed so as to impede a necessary exit, may become even less desirable than a wooden one. How often we find fireproof floors and wooden staircases inclosed by wooden-framed partitions, or stories packed with inflammable goods lighted by ordinary wooden skylights. These and many more inconsistencies in construction may be referred to, to show that the most stringent by-laws and the most perfect system of construction may co-exist with conditions that would nullify any resisting powers to the spread of fire in the materials of a building.

Increase in the number of fires of late calls attention to the observance of certain necessary precautions in all our larger buildings in the Metropolis and elsewhere. Only the other day the owner of a large block of high buildings, in Buckingham Gate, let as flats, was summoned for penalties for allowing the occupation of stories over 60ft. above the street level without the Council's certificate that there were adequate means of escape in case of fire. The plans submitted by the owner were stated to be unsatisfactory. Staircases were the only means of escape provided, and the evidence showed that the builder was placed in a position of great difficulty because no definition of what the County Council officials required could be obtained. As the defendant was willing to do all the Council required, the magistrates granted a month's stay.

In a building of this kind there ought not to be any doubt as to the intention of the London Building Act with regard to "adequate means of escape." To refer to the Act, the 63rd section states that "Every new building exceeding 60ft. in height shall be provided, the upper surface of the floor whereof is above 60ft. from the street level, with such means of escape in the case of fire for the persons dwelling or employed therein as can be reasonably required under the circumstances of the case, and no such stories of such building shall be occupied until the Council shall have issued a certificate that the provisions of this section have been complied with in relation thereto." What are intended by the words "reasonably required under the circumstances of the case"? Are we sure that what is considered adequate and sufficient in one case will be so construed in another building on similar conditions? There is nothing definite in the section, the Council reserving to themselves the power to deal with each case as it arises. No doubt it is reasonable not to define a method or make a hard-and-fast rule; but in such a case as this it would not be difficult to require not only staircases of certain design and construction, but easy means of direct access to the roof, and external iron ladders. As it stands, the Section does not give any idea of what is meant as reasonable means of escape, so that owners and their architects are left completely in the dark as to what kind of escape should be provided. Even the magistrate's decision seemed to imply the difficulty of the builder, or that he had a justifiable excuse in not complying with the Council's requirement. The clause quoted above is one of the new provisions of the last Act. The Council have power to make by-laws for the prevention of fires, and no subject is one that demands attention in any revision of the Act.

One other matter of constant recurrence has reference to the floors and staircases of buildings covering a large area, which are provided by the Act (section 74, subsection 3)

to be of fire-resisting materials. In our issue for last week we reported the case of the summons of a builder for not complying with this section in the erection of a large block of model dwellings for the Portland Industrial Dwellings Company at the corner of Paradise-street, Marylebone. The block covers an area of over twenty-five squares. The Act says, "That in every building exceeding twenty-five squares in area, containing sets of chambers, or offices, or rooms, tenanted, or constructed or adapted to be tenanted by different persons, the floors and principal staircases shall be of fire-resisting material." It is held that building the floors and fireplaces were so constructed. It was contended by the company that the subsection mainly referred to large buildings like flats, containing three or four rooms intended to be occupied by different persons, and with an outer door. Every one of the rooms might be let off separately; but Mr. Plowden ruled that "separate sets" had nothing to do with offices or rooms; but referred to chambers. Every kind of room, office, or set of chambers which was inhabited at all should, therefore, have fireproof floors. Consequently, he held that this building contained sets of chambers, rooms, or even if not sets, they contained rooms which required fireproof floors. It was ordered that the defendant should comply with both this section and section 68 of the Act, and pay five guineas costs. The case came certainly within the last section, for there was no question that the building was over 125,000cft. in extent, and it was enacted under this section that in every building of more than that cubical extent constructed or adapted to be used as dwelling-houses for separate families the floors of lobbies, corridors, landings, and flights of stairs should be of fireproof material, and carried by supports of a similar material. Coming within the meaning of both these sections, there could be no legal ground for escape; but the very frequent attempts made to override these sections, or rather to build in ignorance of their application, shows that there is some doubt about the meaning of the sections in particular cases. When we think of it, however, these rules are rather on the side of leniency than otherwise; for, as we have pointed out before, the limit of area—25 squares—will include many buildings of large extent that require as much protection as those that exceed it in area. When we consider that a square equal 2,500 superficial feet, a very large proportion of block dwellings and houses let out to tenants and families are practically exempt from any provision as to fireproof flooring and staircases. A building 50ft. square, or one of, say, 20ft. frontage and 125ft. in depth, would come within this area, and would be exempt. These hard-and-fast rules as to areas and cubical contents are not very satisfactory, as they enable the evasive builder to take advantage, as the cubical or superficial extent of some structures may be difficult to ascertain, and the square measure method would be to make it compulsory that all dwellings and model blocks of certain height let in separate sets of rooms or offices for different persons should have floors and staircases of incombustible materials.

Then the regulations and by-laws that are framed never appear to be made with any application to the real conditions of buildings. These sections apply alike to structures of offices as well as of sets of dwellings; to those in which very combustible trades are sometimes carried on as well as to those where they are not; to buildings stocked with inflammable goods as well as those where the risks of fire are small. Mr. Edwin O. Sachs pointed out the serious nature and frequency of theatre fires, which called for energetic preventive measures, and he considered the order of precedence for safety were "straight-forward planning, regular watching, skillful

inspection, and good construction"; construction is thus put last. The conditions that favour fires may, and often are, present in so-called "fireproof" buildings as the storage of inflammable material in any quantity, materials of an explosive character, currents of air that easily fan the burning embers into flame, large areas of space, unprotected shafts and staircases. These conditions require a speedy application of certain measures—means for speedy extinction is one of the main necessities, and this presupposes regular watching and inspection. In theatres "regular attendance of reliable fire-watchers, day and night, especially during the performance, was more necessary than any amount of surprise visits." We rather dwell on the importance of well-devised planning—a point that has certainly been made little of in connection with fire-prevention in building. In the arrangement of warehouses in which quantities of inflammable goods are often stored, we should recommend that the area or space should be divided as much as possible by partitions of noncombustible materials; or where large areas are necessary, folding sliding or hinged shutters of steel, that can be lowered from the ceiling or closed against the walls, which shutters or fire-curtains would be at once closed when a fire broke out in any part of the area. All window openings should be fitted with fire-resisting glass, such as the "electro-glass" of the British Luxfer Prism manufacture, so that if a fire broke out in one floor it could be dealt with before involving those above or below it. Unless there is a large quantity of combustible material between two floors, a fire can seldom imperil the whole building, if the floors are fire-resisting, and there is no connection with the other stories by lift or staircase. Means for closing all vertical and horizontal openings is one of the imperative conditions of safety, provided, of course, that means of rapid exit are insured. It will be said these means and expedients cannot be provided, or if they are, escape from a threatened fire would render the best regulations futile, as the exits would be in all probability left open. No doubt there are difficulties, but the rapid closing of fire-resisting curtains or shutters, windows and doors, could be done by mechanical or automatic means, in the case of warehouses or large business premises. We are quite sure that fire-prevention has been dealt with from imperfect data, as if it all depended on the use of incombustible materials in the structure, or in the ingenious method of a floor. Too little has been devised with regard to rapid exit, to proper subdivision, to the prevention of draughts, and to the conditions that favour outbreaks—as the storage in large quantities of inflammable goods without adequate means of extinction,

ARCHITECTURAL QUESTIONS.

TWO or three questions of architectural interest were broached by the President of the Royal Institute of British Architects in his opening address, a report of which we gave in our last issue. One of the subjects touched upon was Metropolitan Improvements, a question which occupied the attention, we believe, of the last Architectural Conference when a paper by Mr. Emerson was read, advocating a Ministry of Fine Arts, to which all matters of design should be submitted. That a ministry of the kind is demanded in the interests of the Metropolis and the nation needs little argument when such important undertakings as the Strand-Holborn thoroughfare, the widening of Piccadilly, and the Victoria Memorial are contemplated. These three improvements alone are on a scale that call for more than local administrative powers and taste; they will have consequences of such moment, and will contribute largely to the embellishment

of the Metropolis. A committee of public taste or a Royal Commission would at least control the building lines and elevations, and prevent any glaring disfigurement or awkwardness of frontage being perpetrated. As the President says, the whole question of rebuilding ought to be considered now, so that all edifices pulled down and reconstructed should conform to a general plan, instead of being dealt with in a fragmentary manner, as leases fall in or buildings are destroyed by fire. The rebuilding of insanitary areas by blocks of flats, and the consequent obstruction to light and air, is a matter that should also be controlled by an authority who would consider the various bearings of the case; so also our railway viaducts ought to be subject to a Parliamentary committee, so that nothing atrociously shocking or ugly should be erected.

On the question of assessors in competitions, the conclusions drawn by the President are not so convincing. We do not doubt that out of the many expressions of dissatisfaction coming from architects on the selection of unsuitable assessors by the Institute there are some that have no foundation in fact, or are expressions of individual pique arising from disappointment; but it is hardly evidence to assume that out of the twenty-four assessors nominated by the Institute no expression of dissatisfaction arose at the awards. "In not a single instance" out of this number, we are told, "was the award of the assessors set aside." This may be so; but we cannot draw the conclusion that the awards in every case gave satisfaction because the awards were not expressly disputed or set aside. To set aside an assessor's decision is generally the committee's action; competitors find fault, but have to submit. It is said that out of 97 competitions there were 73 of them in which the authorities chose their own assessor, and out of this number the awards were set aside and dissatisfaction expressed in twelve cases, or one in six. But we have no explanation of the mode of selecting assessors by these authorities. When the Institute nominates we should expect at least to find the right man chosen for any particular design; but we have no proof that such has been always the case. Of course, an assessor who is appointed after the conditions have been issued to competitors is not placed in an advantageous position, and if he makes an alteration in them, it is not quite fair to the competitors. An assessor cannot please everyone, we do not expect him to;—all the Profession look for is the selection of a man thoroughly competent to judge of the particular design to be submitted to him, and to exercise no partiality as to style. This is one reason why two assessors would be better than one only.

Turning from professional politics to questions of more architectural interest, Mr. Emerson touched on bridge design and the planning of large churches. We have lately spoken of the former topic. If we are to construct bridges that are to be architectural in their design, we must enter into the subject from an engineer's point of view before we are in a position to dictate anything about their design; we must regard the problem as he has to consider it—first mechanically, and secondly with reference to all the conditions of the structure, and the materials to be employed. As a matter of fact, the architect is inclined to approach the subject from his own point of view; to ignore the conditions and principles upon which the engineer bases his design, and to adopt forms in iron which would be exceedingly uneconomical, or a style of masonry that would be costly and massive. The architect must be prepared to enter into the problem of bridge construction from the modern engineering point of view, or at least he must be able to show how steel, concrete, and other materials can be made to subserve the end in the best way they can. The architect's ideas are

often opposed to the mechanical or physical consideration, which the engineer places first, for he tries to make his design accord with the traditions of masonry. Added ornamentation is quite out of the question, and the form and section of the arch ribs, the curve of the roadway, and the form of the piers should be dictated by the principle of construction. We believe that better and clearer views of bridge architecture would result from the mutual discussion between civil engineers and architects. One meeting of this kind took place last year; but we believe the architects were badly represented, and left the discussion to the engineers. If anything is to be done, the minds of both professions must be free, they must not meet preoccupied with their own prejudices and ideas, and, above all, each must look at the problem from the opposite point of view.

The President's remarks on the planning of large churches were at least suggestive, if not practical. Mr. Emerson's design for Liverpool Cathedral was to some extent an embodiment of principles that have a traditional value, and was certainly the best design submitted; but, as Mr. G. H. Fellowes Pryne pointed out, there were difficulties in the way of making radical changes in the accepted principles of church planning. The view held by Beresford Hope that the "altar and its adjuncts should stand well forward," is one that has been kept in view by modern church architects, and the President's suggestion is on similar lines. He would not only bring the altar well forward, instead of being buried in a long chancel, but provide a large open space for worshippers. He suggests the placing of the altar at the entrance to the choir instead of at the east end, with the clergy choir, and bishop's throne behind the altar, as it formerly existed at Canterbury and in many of the old Basilican churches, as mentioned by the President. No one disputes that this was the early arrangement; but the Medieval plan is typified in San Clemente and other basilicas where the choir is brought forward into the nave for obvious reasons—one of them being the impossibility of placing the altar half-way down the nave, with worshippers behind the altar. As Mr. Pryne pointed out, they "did not want their churches to be mere preaching houses or music-halls"—an idea equally repudiated by the President. The "all-seeing," "all-hearing" ought not, of course, to be the main motive of church planning, though in the design of large town churches the principle should be kept in view.

The question is certainly a difficult one. In cathedrals as Lincoln and York we find a second altar placed in the nave west of the choir or rood-screen for popular services, and this two-altar arrangement has been adopted in other cathedral churches; but the plan could not be revived in our new churches without sacrifice of space. The present arrangements of our cathedral and parish churches are based on traditions that cannot be heedlessly thrown aside. The choir intervening between the altar and the worshippers appears to be the natural order; but if the altar is to be made a conspicuous feature at the entrance to the choir, as suggested, a radical change in the plan of the building will be necessary; and yet in a domical structure with a crossing we could still retain the semblance of a dignified and monumental building. The subject is one that deserves discussion, if only as an academic question, especially when designs for a large cathedral church for a populous city are being considered.

THE NEW GALLERY.

THE exhibition of the Society of Portrait Painters at this gallery is not so interesting in the choice of subjects as we have before seen, though we have contributions from many eminent masters of portraiture in

various styles of presentment, from stern realism to impressionist ideals of expression in light and colour. Of course, there are to be seen a number of ordinary-looking people in costumes of doubtful taste, in company with distinguished faces and slim figures of feminine grace and beauty. In the West Gallery we notice the portrait of "Mrs. Arthur Franklin," by John Lavery, a dark lady in black, and the same painter's "Madame la Baronne de H—," seated, in low brocade dress, very elegant and graceful. J. J. Shannon, A.R.A., has a clever portrait study of "Marjory, Daughter of W. J. Shannon, Esq.," in large black hat and grey jacket. The eyes are rather obscured by the shade of the hat, and we regard the work rather as an impression of character than a mere likeness. It is framed in an antique-looking carved wood frame which harmonises with the low colouring. Professor Von Leubach's double portrait of the artist and his daughter must be placed in the same category of portraiture. The little girl with light hair has one arm round the neck of her father; her large penetrating eyes come out of the picture with remarkable intensity, and the father's deep-set but equally penetrating eyes in spectacles are full of character and force. The portrait of Stopford Brooke, by Robert Brough, shows the author sitting before a table in brown coat, wearing a red necktie; the face is handsomely well modelled. A full-length portrait of "Mrs. Woodward Baldwin" (11), by Herman G. Horkomer, shows the lady in grey dress and hat; a note of colour is the red rose in her bodice. The figure stands in a landscape. The work has the merit of a literal interpretation, drawn from life. G. F. Watts, R.A., has in this gallery portraits of The Earl of Shrewsbury (15), Miss Margery Dunthorne (16), John Burns, M.P. (19), The Marchioness of Northampton (28), and Sir Benjamin Brodie (38). Miss Dunthorne is a blonde; a young, rosy face, shaded under a large fancy straw hat, trimmed with blue ribbon. The soft effect of the face and the warm colour in a light key, make a charming study of youthful beauty and grace, which contrasts with the strong, stern, and rigid features of the Member for Battersea. As a study in golden hues is the painter's "Marchioness of Northampton" (28), an elegant but rather simply-attired figure. A full-length standing figure of Lord Roos, his greyhound by his side, by J. J. Shannon, is a centre subject, characteristic of face and figure, and firm in handling; and we also notice the same painter's able and fanciful study "The Lady with a Chinese Fan" (23), a singularly graceful composition of a seated lady in dull-brown dress, overlaid with a rich lace or network of small knots. The fan in her right hand hangs carelessly down, and forms a note of colour to the low-toned picture. "Elkan Kosman" (25), by George Henry, is a strong piece of portraiture; the cleverly managed way in which the light falls on the dark sallow face deserves notice. R. Jack is another portrait painter, whose ladies and children are interesting and graceful. We notice his "Norah," a little dark girl seated at the foot of a tree in a white frock (20). "Doris," another bright study of child life, in a scarlet cloak, seated in armchair. The scarlet is relieved by the white-trimmed bonnet and collar and strings. There is much naturalness, and the light is skilfully introduced. His seated portrait of "Mrs. Alyn Williams" (61) in the North Gallery, in low-cut pale canary dress, a black cloak partly thrown off, is a very graceful work.

There is refinement of colour in the group by Henry J. Hudson (14), "Mrs. W. H. Banks and her Daughter," in delicate blue and lace, the girl in white standing near her mother; and we also notice a vigorous portrait of "Claude Ponsonby" (30), by A. Mancini, whose technical handling is worth

notice. The high lights are "loaded" with pigment, which reflects the light, and the hand is also made conspicuous in the presentment; but it is a strong and forcible work. The portrait of The Hon. Florence Hamilton Russell (39), by the Hon. John Collier, a standing, full-length figure clad in light pink soft silk, is charmingly painted and delicate; we must also note Harrington Mann's full-length presentment of "Miss Tibbie Nairn" (57), in a plain greyish-green dress; J. J. Shannon's clever portrait of a boy (39), full of character and expression; A. Neven du Mont's portrait of his wife (41), a full-length, flat-painted figure of a lady, in grey costume, putting on white gloves and blue hat, is very delicate in colour; also an idealised portrait by F. E. Lazo (42), and T. B. Kennington's portrait of his daughter are noteworthy.

In the North Room, at the end, hangs a cleverly-painted portrait study by the Hon. John Collier of "Miss Mab. Paul in 'Beau Austin'" (64), a clever impersonation. The toilet of the young lady character is faultless in her violet-figured dress over a rich embroidered petticoat of golden hue. She is shown seated in the corner of the room, her profile and figure being reflected in a mirror on the adjoining wall. As a piece of characterisation it is clever. There are also portraits by John McClure Hamilton (49), John Lavery (53, 55) of much expression, F. Markham Skipworth (57), Mrs. Waller (58), a portrait of Miss Glazebrook by Horace G. Hermon of Cardinal Rampollé in his scarlet robes, by George Sauter (71), a felicitous portrait of "The Right Hon. Lord Justice Vaughan Williams" (74) by Robert Brough, and a study in colour, "Violent and Blue" (7), "The Red Feather," by J. McNeil Whistler, is clever and subtle; also C. H. Shannon's half-shaded portrait of himself in a blue striped shirt—a portrait of the man, quite natural, and devoid of any restraint and convention. A nice group of a mother and children, by Percy Bigland (81), is also interesting as a sunlight effect through foliage; and the nimble group of Hugh de T. Glazebrook (86) is charming and full of life. In the South Room we can only name some of better pastel and other chalk studies of expression and character by W. G. von Glehn (91), Miss Lisa Stillman (92, 99), Professor A. Legros (97), H. Harris Brown (114), Hon. John Collier (111), S. Melton Fisher (120), H. William Orpen (105), Harrington Mann, Hugh de T. Glazebrook (123), and a portrait of the great explorer, Professor Flinders Petrie, by G. F. Watts, R.A.; also portraits of Miss Eva Wertheimer, Professor Von Leubach (153), Hugh C. Riviere (138), and others. In some of these, as in William Orpen's "Two Portraits," and Miss Lisa Stillman's studies, we notice the attempt to avoid all restraint and stiffness; we see the models and sitters coming out of themselves and appearing quite natural. A good portrait ought to give the real hidden character, if possible; the eyes should not seem to be painted, but should really see, and so of the lips; they should also express the character of the sitter, as in Professor Von Leubach's work.

Mrs. Henry Rogers, of Bournemouth, has offered to present a costly reredos to be placed in Holy Trinity Church, Heath Town, Walsingham, as a Jubilee memorial. The church will have been built fifty years in July, 1902. The offer has been accepted.

The Bishop of St. Asaph has formally dedicated the new window which has been placed in Holy Trinity Church, Oswestry, as a memorial of the Queen Victoria. The subject is the resignation of an earthly for an heavenly crown. In the centre is a figure representing the late Queen in royal robes, having just crossed the bridge of death, kneeling, laying down the crown, orb, and sceptre at the feet of the King of Kings, and receiving from His hand the crown of everlasting life. Behind the kneeling figure stand two angels, representing Gentleness and Love.

HOW TO ESTIMATE: OR, THE ANALYSIS OF BUILDERS' PRICES.—XXX.

By JOHN T. REA, F.S.I., Surveyor, War Dept.

IRON FOUNDER.—continued.

	Supplied only, including halfdrift, spikes, brackets, bolts, and nuts								Added if fixed including joints
	3in.	3½in.	4in.	5in.	6in.	7in.	8in.	9in.	
Rainwater gutters, semicircular putters	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
6 in. ditto	0 23	0 3	0 4	0 6	0 8	1 0	1 2	1 4	1 6
8 in. ditto	0 4	0 7	0 9	—	—	—	—	—	—
Ditto copper heads flat	each	2 6	3 3	4 0	—	—	—	—	—
Perforated covers for heads	"	1 2	1 4	1 6	—	—	—	—	—
Add 20% to pipes for shoes, bends, swan necks, &c.	"	1 11	1 4	1 6	—	—	—	—	—
Ditto to gutters for angles or bends	"	0 43	0 6	0 7	0 9	0 11	—	—	—
Ditto ditto for stopped ends	"	0 43	0 6	0 7	0 9	0 11	—	—	—
Ditto ditto for nozzles or outlets for rainwater gutters	"	0 43	0 6	0 7	0 9	0 11	—	—	—
Ditto ditto lion-headed	"	0 7	0 7	0 8	0 9	0 10	—	—	—
Copper wire hemispherical gratings over outlets in eavesgutters to down pipes	"	1 9	2 0	2 4	2 9	3 0	—	—	—
Galvanised iron wire ditto	"	1 3	1 6	1 8	1 10	1 0	—	—	—
Strainers for heads of rainwater pipes	"	0 2	0 3	0 4	—	—	—	—	—

	Soil pipes, &c.				Supplied only if fixed
	3in.	3½in.	4in.	5in.	
Down-pipes, heads, shoes, bends, gutters, &c., once or square-moulded, other than foregoing	per lb.	0 23	0 0	—	—
4in. soil-pipes, weighing 50lb. per ft. length, joints milled with yarn and run with lead when fixed	per foot run	1 4	0 5	—	—
4in. ventilating pipes, weighing 37lb. per ft. length, ditto	"	1 1	0 5	—	—
Copper wire domical wire guards for ditto	each	2 6	0 3	—	—
Galvanised iron wire	"	1 9	0 3	—	—
Ducksfoot bend for 4in. soil-pipe, with brass-iron 1in. square, weighing 14lb. each	"	8	0	—	—
Branches for soil-pipe, single, weighing 23lb. each	"	6	0	—	—
Branches for soil-pipe, double, weighing 32lb. each	"	7	0	—	—
Taking down gutters, pipes, &c., and remove to store	per foot run	0	4	—	—

	Weights.				3in.	3½in.	4in.	5in.	6in.
	3in.	3½in.	4in.	5in.					
Half-round gutter, exclusive of brackets, &c., per ft. length	9	11	13	16	—	—	—	—	—
Once gutter ditto	13	14	16	20	—	—	—	—	—
Rainwater pipes ditto	24	29	34	64	—	—	—	—	—
5in. cast-iron moulded eavesgutter, weighing 20lb. per ft. length, with plain facets joints put together with screws and red-lead joints, and drilled for rivets to deal fascia, and making the joints, including 1½in. stout screws No. 3 to each ft. length	per foot run	1	0	—	—	—	—	—	—
Extra for stopped ends to ditto	"	1	6	—	—	—	—	—	—
internal or external angles	"	1	6	—	—	—	—	—	—
4in. cast-iron stop-pipe, weighing 34lb. per ft. length, and jointing in red-lead, and passing into lue	per foot run	1	3	—	—	—	—	—	—
Bends for ditto, weighing 14lb. each, and fixing	each	3	6	—	—	—	—	—	—
Elbows with cleaning door, 9½lb. each, and fixing	"	3	6	—	—	—	—	—	—
4in. cast-iron main with spigot and socket joints, supplied only	per cwt.	13	0	—	—	—	—	—	—
Extra price for bends, tee-pieces, &c.	"	6	0	—	—	—	—	—	—
Laying ditto, including glue, yarn, or sheet-lead, red-lead, or white-lead and oil for joints, and making the joints and running with lead, and coating with Dr. Angus Smith's preparation	per yard run	0	6	—	—	—	—	—	—
Laying bends, including two joints	each	2	0	—	—	—	—	—	—
tee-pieces, including three joints	"	7	6	—	—	—	—	—	—
plugs and joint	"	4	6	—	—	—	—	—	—
Cutting out length of pipe in existing main	"	7	0	—	—	—	—	—	—
Tapping 4in. main for 1½in. pipe, and jointing with yarn and red-lead	"	4	0	—	—	—	—	—	—
2in. Brighton pattern by-valve, supplied only	"	35	0	—	—	—	—	—	—
2in. Brighton pattern stop-valve, supplied only	"	40	0	—	—	—	—	—	—
4½in. tin. hydrant box, supplied only	"	2	0	—	—	—	—	—	—
Fixing only tin. cast-iron lue valves	each	25	0	—	—	—	—	—	—
surface-boxes for ditto	"	3	0	—	—	—	—	—	—
screw-down valve hydrants	"	10	0	—	—	—	—	—	—
surface-boxes for ditto	"	3	0	—	—	—	—	—	—
surface-boxes for 1½in. stop-cocks	"	2	0	—	—	—	—	—	—

Coating water pipes, 4in. to 6in. dia., inside and outside, according to Dr. Angus Smith's process with heated coal-tar and linseed oil, and cleaning pipes, per yard run. 0 13
Ditto pipes 2in. to 4in. dia., ditto 0 11
Ditto pipes under 2in., ditto 0 08
Galvanising large articles 25lb. and over per cwt. 7 0
" small articles under 25lb. 5 6

Holes in Pipes.

	4in.	5in.	6in.	8in.	10in.	12in.	14in.	16in.	18in.	20in.
Drilling holes in pipes, &c., for connecting pipes, each 0 38	0 41	0 43	0 43	0 51	0 60	7				
Tapping ditto " 0 31	0 41	0 43	0 51	0 60	7					

Holes in Iron.

	4in.	5in.	6in.	8in.	10in.	12in.	14in.	16in.	18in.	20in.
Holes drilled and cut in iron, each 0 1	0 10	0 20	0 30	0 40	6					
" 2in. to 4in. dia., " 0 11	0 12	0 20	0 30	0 40	6					
" 4in. to 6in. dia., " 0 12	0 10	0 20	0 30	0 40	6					
" 6in. to 8in. dia., " 0 12	0 10	0 20	0 30	0 40	6					
" 8in. to 10in. dia., " 0 12	0 10	0 20	0 30	0 40	6					
" 10in. to 12in. dia., " 0 12	0 10	0 20	0 30	0 40	6					
" 12in. to 14in. dia., " 0 12	0 10	0 20	0 30	0 40	6					
" 14in. to 16in. dia., " 0 12	0 10	0 20	0 30	0 40	6					
" 16in. to 18in. dia., " 0 12	0 10	0 20	0 30	0 40	6					
" 18in. to 20in. dia., " 0 12	0 10	0 20	0 30	0 40	6					

If done in position, double the foregoing rates.

Holes punched through sheet iron, each 0 03										
" ditto and counter-sunk, " 0 04										
Cutting rounded corners or notches up to 3in. girth in W.I. plates, " 0 03										
Holes in tin plates, " 0 01										
Turning or boring wrought iron, brass, or gun-metal, " per square inch 0 1										
Ditto cast iron " 0 13										

ROOFING AND RANGERS.

Gurney stove, size A, to warm room of 120,000 ft. cub., and burning 10lb. of fuel per hour, weighing 250wt. each, 30 5 0										
" size B, to warm room of 70,000 ft. cub., and burning 9lb. of fuel per hour, weighing 180wt. 20 16 0										
Ditto size C, to warm room of 30,000 ft. cub., and burning 6lb. of fuel per hour, weighing 80wt. 12 15 0										
Gallow's ventilating grate, 30" x 24in., heats 2,500 ft. cub. 3 8 0										
Self-acting "London" cottage range, oven and boiler, 48in. 1 10 6										
Improved "London" kitchen range, oven and boiler, 48in. 5 0 0										
Extra strong "Leamington" range, oven and boiler, 60in. 11 0 0										
The "Self-sterilising" kitchen range, oven and boiler, 36in. 4 6 6										
The "Horsewife" stove, oven and boiler, 35in. long, without utensils 1 8 0										
Trade discount for ranges and stoves 20 to 25 per cent. off foregoing.										

VENTILATORS.

Arnett's ventilators, bronzed or laqueered, small size, each 8 0										
Ditto ditto large size, " 11 0										
Boyle's mica flap ventilators, plain iron, 12in. x 12in., each 4 0										
" 11in. x 10in. " 3 0										
" 10in. x 9in. " 2 0										
Boyle's latest patent "Air-Pump" soil-pipe ventilator, 8in. dia. head, 4in. dia. pipe, galvanised and painted, Design No. 227 13 6										
Ditto Ditto cheap form, Design No. 227 10 6										
Boyle's latest patent "Air-Pump" ventilator, Design No. 175, 18in. dia. head, 8in. dia. pipe 55 0										
Ching's mica valve chimney-breast ventilator, plain iron, box size 9in. x 3in., each 4 0										
Ditto ditto 9in. x 3in. " 3 0										
Ditto ditto 14in. x 9in. " 15 6										
Ching's silent mica flap ventilators with iron fronts, plain iron, box size 9in. x 3in., each 7 0										
Ditto ditto 9in. x 3in. " 15 0										
Ditto ditto 14in. x 9in. " 7 0										
Sheringham's ventilators, plain iron, box size 9in. by 3in. 1 0										
Ditto ditto 13in. by 6in. 5 6										
Ditto ditto 9in. by 6in. 5 6										
Sanitary mica valve inlet ventilator, pigfoot, 12in. vent-pipe, each 10 0										
Iron wire guards for windows and skylights, lattice pattern, 12in. to 24in. mesh, supplied only 0 84										
Add, if galvanised after manufacture 0 12										
Fly wire or wire gauze, under 12in. mesh, supplied only 1 1										
Add to foregoing, if fixed 0 2										

INTERIORS.

C. Winn and Co's gully, wrought-iron, 4in. x 4in., 14in. V.I., 20in. V.I., each 0 16 3										
Ditto ditto 14in. V.I., 20in. V.I., each 1 8 9										
Ditto ditto 20in. V.I., 24in. V.I., each 2 0 0										
Ditto ditto 24in. V.I., 28in. V.I., each 3 13 6										
Ditto ditto 28in. V.I., 32in. V.I., each 4 13 0										
Ditto ditto 32in. V.I., 36in. V.I., each 4 13 0										
Iron sliding door, 7ft. by 4ft., with 12in. plates, sills and rails, 12in. thick, guide, channel runner bar, hangers, cast-iron bored wheels, steel pins handle, brass, &c. each 7 0 0										

IRON ROOFS.

These may be had complete, as Fig. 17, for

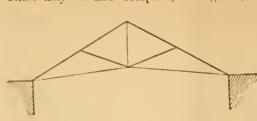


FIG. 17.

spans of 15 to 25ft. as follows:—

Span.	T-Rafters.	T-Struts.	Ties.	Price complete.
15ft.	2" x 2" x 2"	2" x 2" x 2"	1/2" x 1/2" x 1/2"	£ 2 10 0
20"	2" x 2" x 2"	2" x 2" x 2"	1/2" x 1/2" x 1/2"	£ 3 5 0
25"	2" x 2" x 2"	2" x 2" x 2"	1/2" x 1/2" x 1/2"	£ 3 17 6



FIG. 18.

Ditto, as Fig. 18, for spans of 20 to 30ft.:

Span.	T-Rafters.	T-Struts.	Tie Rods.	Price complete.
20ft.	2" x 2" x 2"	2" x 2" x 2"	1/2" x 1/2" x 1/2"	£ 3 10 0
25"	2" x 2" x 2"	2" x 2" x 2"	1/2" x 1/2" x 1/2"	£ 4 4 0
30"	2" x 2" x 2"	2" x 2" x 2"	1/2" x 1/2" x 1/2"	£ 4 18 0

For light galvanised sheds, buildings, and roofs, where cheapness is requisite, roofs can be erected at a cost from 10d. to 1s. 3d. per foot of space covered.

COPPERSMITH.

Wrought copper in ties and cramps, supplied only, per lb. 1 6					
Add if fixed, " 0 2					
Brass or gunmetal castings, supplied only, " 0 2					
Add if fixed, " 0 2					
Add if drilled and fitted complete, " 0 4					
Sheet copper to roofs, &c., including copper nails for fixing, supplied only, " 1 6					
Add if fixed, " 0 1					
Welded edge or seam, " per foot run 0 4					
Copper in sheathing, 12oz. per foot super, including seams, lugs, copper ties, nails, fixed and labour, " per foot super. 1 6					
Ditto 16oz. ditto ditto " 2 0					
Ditto 18oz. ditto ditto " 2 6					
Taking up, redressing, and relaying copper sheathing, any weight, " 0 43					
lin. by 1/2in. copper tape lightning conductor, weighing 24lb. per foot, " per lb. 0 8					
lin. and 1/2in. gunmetal bolthead for ditto " 1 0					

BELLINGER.

Hones bells of: s.d.					
1 part in 4 and 4 parts copper, " per lb. 1 6					
1 " 1 " 3 " 3in., " 1 0					
1 " 1 " 3 " 4in., " 1 4					
1 " 1 " 3 " 4in., " 2 2					
Add if with springs, collars, and pendulums, " 2 3					
Common brass cranks for bells, supplied only, " 0 8					
Add if fixed, " 0 8					
Ditto mounted pillar or T-plate, single or double, supplied only, " 0 9					
Add if fixed, " 1 1					
Bronzed bell-pulls, outside, with sunk handle, supplied only, " 5 0					
Add if fixed, " 1 1					
Brass bell-pulls, outside, with sunk handle, supplied only, " 1 0					
Add if fixed, " 1 0					
Ditto lever, with white knob, supplied only, " 4 0					
Add if fixed, " 0 6					
Galvanised bell-staples, " per doz. 0 3					
Bells hung complete in secret zinc tubing, with best mounted cranks, copper wire, check springs, staples, and labour, excepting the bell, spring, and carriage, pull and rope—on same floor, " per pull 11 0					
Ditto ditto one story, " 13 6					
Ditto ditto two stories, " 15 6					
Ditto ditto three stories, " 16 6					
Electric bells, fixed complete, " per foot run 1 6					
lin. zinc spigot tube, with socket joints, and fixed, " 0 4					
lin. zinc bell pull, " 0 6					
Extra for circular chimes, " each 1 0					
Connecting screws, " 1 1					
Wire crutchpiece, with whistle, " 0 6					
Ebonite, " 3 6					

MATERIALS (Supplied only).

Asph. coal, sifted, " per bushel 0 3					
" forge, " " 0 3					
Asbestos, ordinary millboard, " per lb. 1 0					
" rubber veneer sheeting, " 3 6					
" composition, No. 1 quality, dry, per cwt. 23 0					
Borings, iron, " 6 0					
Breast or coal dust, " 1 0					
Borax, lump, " per lb. 0 4					
" powdered, " 0 5					
Brass, sheet, Nos. 16, 18, or 20 gauge, " 1 6					
Cement, iron, " 0 6					
" red lead, " 0 6					
Coal for forges, smith's, " per ton 29 0					
" Newcastle, or other of equal quality, " 24 0					
Coke, gas, large, " per bushel 0 3					
Emery powder, fine, " per lb. 0 3					
Gasket, " 0 3					
Indiarubber, vulcanised, for flanges, " 4 6					
Lead for running, " 0 13					
Whitened ground in oil, " 0 3					
Glass paper, white or cream, " 1 6					
" Bangum, for machinery, " 2 0					
Glass, or emery, cloth, " per quire 0 2					
Rivets, best wrought iron, 10 to 24lb. per 1,000, per lb. 0 5					
" galvanised ditto ditto " 0 7					
" rivet, yellow, " 1 6					
Roofing galv. corrugated W.I. sheets, No. 18 S.W.G., with 3in. corrugations 12in. deep, supplied only, 10 to 17 S.W.G., each 4 2					
Ditto ditto 6ft. 6in. by 2ft. 6in., " 4 6					
Ditto ditto 7ft. by 2ft. 6in., " 4 10					
Rivets and washers, 1in. dia. for ditto, per lb. 0 3					
Galvanised W.I. screws, 3in. long, with washers and round heads, " per doz. 0 4					
Galvanised hook bolts, 4in. long, " per foot run 0 6					
Galvanised iron ridge capping, 18in. girth, 20 B.W.G., in. of length, " per gross 11 0					
Spelter, brass, yellow, " per lb. 1 3					
" zinc, " 1 0					
Staples, round, 12in. long and under, " per doz. 0 3					
" 12in. to 24in. long, " 0 3					
Varnish, imperial, for ironwork, " per gal. 5 0					
Waste, cotton, " per lb. 0 6					
Wire, " 2 0					
" copper, " 2 0					
" galvanised iron, 10 to 17 S.W.G., per cwt. 25 0					
" galvanised iron, 18 to 19 S.W.G., " 25 0					
" galvanised iron, 20 to 21 S.W.G., " 25 0					
" netting, galvanised iron, 1in. to 1 1/2in., " 0 3					
Wick, cotton, for lamps, " per lb. 1 0					
Yarn, spun or rope, " 1 0					
Wages, smith's, " per hour 0 10					

(To be continued.)

THE SURVEYORS' INSTITUTION.

AT the ordinary general meeting of the Institution, held on Monday last, the session was opened by the reading of an address by the president, Sir John F. L. Rolleston, M.P., of Leicester, who said that while the past and present position of the affairs with which the profession was concerned afforded little material that was new, he was forced to the more fertile fields of the future, which he approached with some diffidence in addressing so practiced a body as the members of the Institution. The period covered by his professional experience had been marked by two distinguishing characteristics—commercial and urban prosperity and agricultural and rural adversity. The former was illustrated by the growth of towns, the construction of public works, and the increased facilities for trade and intercommunication, while the resulting rise in the price of food, although the consumption of the food which the rural districts could supply had increased largely, the benefit had not accrued to the British and Irish farmer, whose products of bread and butter, cheese and meat, had been ousted from the market by colonial and foreign importations. Whether the British farmer's products would ever be welcomed abroad was a matter of doubt. The farmer and landowner, under these circumstances, must begin seriously to consider whether the present system of the production of food is worth continuing, or whether it would not be better to utilise the land for cultivating timber or textile materials. All schemes for the improvement of agriculture appeared to be devoted to the production of food, for which, in face of the foreign competition, there was no profitable market. He regarded agriculture as a trade carried on for the sake of a profitable return, and did not refer to that class of agriculture which merely afforded sustenance without any salubrious surplus. He said he could see no signs of success and, indeed, his experience led him to regard the prospects of agriculture as well nigh hopeless. But the prospect must be given, and if relief could be afforded, it must be afforded, and some such relief has been provided by the Agricultural Rates Act; but if agriculture

were ever to prosper, further steps in this direction must be taken. The foreign investments of British capital had been estimated by Mr. Gladstone to reach 2,000 millions sterling, and the amount was now probably 3,000 millions, and the amount was now devoted to promoting enterprise abroad, while it had done nothing towards fostering industry or paying wages at home. The possessors of the income derived from the enormous capital lived for the most part in the country, and had the advantages which other residents had, while their contribution to the rates bore no such proportion to their income as did the farmers'. Even supposing that his rent was one-tenth of his income, he was paying rates at the same rate as the tenant, while the farmers of the parish would be paying on an assessment above their gross income. (It had been contended that urban rates were higher than agricultural rates; but the fallacy of this argument was evident when it was remembered that it was not the number of shillings in the pound only, but the number of pounds on which the shillings were paid, which made the difference. The President gave instances of cases where the overflow of residential population from large towns into the country had immensely increased the burdens of the farmers, while the new owners of the newly paid rates on moderately assessed houses. The farmer was a reserved customer to the town, where he did most of his shopping; but the town did its marketing not in the neighbourhood, but throughout the world. The injury by trespass near large towns was also a growing and very real grievance of the farmer. If the land were to be generally suggested, cultivated, and a greater number of pounds on which the shillings would be necessary to remove from it some of the disadvantages under which it at present laboured. The only product of the land which appeared to be increasing in value was timber, the continued onslaughts on the forests of the country would tend to affect the supply of wood, and must always be a necessity, and it could hardly be doubted that some of the now derelict corn land would, if planted judiciously, yield a good return. In many places where saplings were mere weeds, their conservation would be profitable. The disposal of sewage was an ever-present question of the farmer, and light and heat, and the system yet adopted was the bacterial treatment, with final land treatment, where feasible, made sewage could not with advantage be for any length of time applied to land, and the bacterial treatment has been, to a very large extent, abandoned. The water-supply of towns was another important question of the farmer, and he thought we must look to the hill for our future great supplies, and he hoped for the time when his one great absolute necessity of life would be free of the water of the sea, the great collecting areas being acquired by the State in the public interest. The question of housing in towns, the President remarked upon the general failure of the enterprise in this direction. No provision was made for the really poor. The working-man who earned good wages, and could pay a good rent, was the one catered for, while the poor spinster or widow, who worked in a garret, was uncared for. The one constant was the construction of houses which could be let at a shilling or two per week, and which contained but few rooms, after alluding to recent, but still undecided, questions of light and air, and the necessity of an improvement in the street traffic, especially in the metropolis, Sir John Rolleston congratulated the Board on the steady and increasing property of the Institution, and a vote of thanks having been passed by acclamation, the meeting adjourned.

THE WIDENING OF PICCADILLY.

MR. HENRY L. FLORENCE sends us, with reference to the much-discussed schemes for widening Piccadilly, a plan showing a suggestion for a new road to be provided near the Green Park, continuing the line of Jernyn-street and Bennett-street to the arch in Constitution Hill. This scheme would certainly be expensive to carry out, compared with any other, as by it only one house in Arlington-street would be required to be pulled down, and through the Park, parallel with Piccadilly, would be made at small cost, the underground lavatories and conveniences recently formed next Walsingham House would be undisturbed, and the beauties of the Green Park would not be in any way affected, as only a few trees would have to be removed. It will, however, be questioned

by some if the vehicular traffic westward will be increased, or can be compelled, to avail itself of the Jernyn-street and Green Park route, and so avoid the present glut at the narrow eastern end of Piccadilly. If so, Mr. Florence's scheme seems to us well deserving of serious consideration.

SEWAGE AND TIDAL ESTUARIES.

AT the ordinary meeting on Tuesday, Nov. 12, 1901, of the Institution of Civil Engineers, Mr. H. H. Walsby, President, presiding, the chair, the paper read was "The Discharge of Sewage into a Tidal Estuary," by W. K. Parry, M.A., B.A., M.Inst.C.E., and W. E. Adeney, D.Sc. It was stated that the River Liffey, together with the tidal estuary, to which the paper referred, received the sewage discharged not only from the City of Dublin, but from all suburban townships adjacent thereto. The investigations described in the paper were intended particularly to ascertain the effect of the discharge of the sewage of two townships—namely, Rathmines and Pembroke—into the tidal estuary. The chemical analysis of the sewage, and the bacterio-chemical study of sewage, was based upon the examining the estuary-waters was based upon the bacterio-chemical study of sewage. It was well known that unpolluted water, when kept out of contact with air, remained saturated with atmospheric oxygen; but when polluted to a moderate extent it lost oxygen in proportion to the degree of pollution. This loss of oxygen was due to bacterial fermentation. In the presence of a sufficient volume of oxygen this fermentation was of an aerobic character. The dissolved nitrogen suffered no appreciable change, and therefore gave the datum for calculating the degree of original pollution. Carbon dioxide was also formed during the fermentation, and the proportion of the mass of organic matter present, and therefore, by calculating the volumes of these gases before and after keeping the samples, the extent of the original pollution could be accurately ascertained. In making the observations which formed the subject of the paper, care had been taken to collect samples at all states of the tide and under all atmospheric conditions. For purposes of comparison, samples of sea-water from Dublin Bay and samples of river-water above the city of Dublin had been also collected, and the volumes of the dissolved gases and other atmospheric constituents had been accurately determined. The sewage from the townships of Rathmines and Pembroke was discharged from a tank-sewer during the first five hours of each ebb-tide, at a point a little more than a mile above the ends of the training-walls which inclosed that portion of the estuary known as Dublin Harbour. In order to determine whether the condition of the estuary was affected by this discharge as compared with the effect produced by the city sewage which passed into the river itself above Dublin Harbour, it had been necessary not only to examine the water at all states of the tide below the Rathmines and Pembroke outfalls, but also to take a similar series of observations above the outfall. The results of the last named observations showed that at high water of average tides the extent of the pollution of the river above the outfall was very slight indeed. This was obviously accounted for by the volume of pure sea-water entering the harbour at high tide. Corresponding examinations of the surface-water at low spring tides show that under these conditions the surface water was distinctly more polluted. But the bottom samples collected at the same places and at the same times still remained comparatively pure. For the purpose of ascertaining the relative proportions of sea and river water in the several samples collected, the total solids contained in each sample had been estimated. Knowing the total solids in pure sea-water and in river-water, the relative proportions could be readily ascertained after the total solids in the sample had been estimated. In this way it was proved that at low water of spring tides the bottom waters of the deep-water channel from the Pigeon House Fort downwards, consisted of a mixture of five or six parts sea-water and one part river-water, whereas the surface samples taken at the same places consisted of one part sea-water and three parts river-water at the Pigeon House Fort to 2.4 parts sea-water and one part river-water 1.875 yards lower down. The results of similar observations made at the same points at low water of neap-tides were also given in the paper. Corresponding examinations had been made of the surface and bottom

waters at low water of neap-tides below the Rathmines and Pembroke outfall, both within the harbour and outside the harbour, and it was because it had been alleged that at low water of neap-tides the estuary-waters were seriously affected by the tank discharge, and that the polluted water was carried back again into the harbour when the tide began to flow. A number of tables were given in the paper with the full analytical results, and it was intended to show that the loss of dissolved oxygen even in the surface samples in the deep-water channel in no case exceeded 23 per cent. The state of the estuary at low water of average tides was then described, and it was shown that the figures fully confirmed those found for low water of neaps. For the purpose of showing that the polluting matters were not accumulating in the estuary-waters the analyses of samples collected at the same place and at the same state of the tide at intervals of one year were given and compared, and the remarkable similarity of the analytical results was commented upon. The next step in the investigations was to ascertain the effect of gales of wind upon the condition of the estuary-water, and for this purpose analyses had been made of samples collected during strong westerly gales. The Rathmines and Pembroke outfall was then described, and it was pointed out that, although the sewage of some 50,000 or 60,000 persons had been delivered untreated into the deep-water channel of the tidal estuary for 18 years, no permanent deposits of any kind existed either near or below the outfall. In order to ascertain the relative volumes of sewage and clean water in the tidal estuary, the discharges from the Rathmines and Pembroke outfall were observed and computed both at spring and at neap tides. The liquid which was then discharged consisted of sewage from which the heavier solids had been previously removed, together with considerable volumes of subsoil-water. These calculations were corroborated in a remarkable way by the analyses. To determine with accuracy the solids removed from the sewage, a series of observations had been made from which it appeared that the quantity of dry solids removed might be taken as about 1½ tons per day. The immediate effect of the discharge was the change of sewage at all states of the tide and under varying atmospheric conditions very fully explained and commented upon, and it was pointed out that whereas the immediate effect of the discharge was to increase very greatly the dilution, and thus to facilitate the dispersal and oxidation of the organic matter, the extent of the pollution did not progress with proportionate rapidity. The preceding observations and analyses afforded an explanation of the way in which the sewage was disposed of when it was delivered into the sea and river water. It was also pointed out that although the great dilution contributed to the rapid disposing of the sewage by dispersing the organic matter, the resolution of this matter into harmless inorganic substances and gases by bacterial fermentation and other agencies did not take place to any large extent in the estuary itself, but was slowly effected after the liquid reached open sea. The paper contained a number of valuable lessons which might be learnt from the observations and researches described and recorded, and also the general conclusions which might be drawn as to the conditions under which untreated sewage might be safely discharged into a tidal estuary similar to that of the River Liffey.

The urban council of Northwich have adopted a scheme by Mr. Baldwin Latham, C.E., for the re-sewering of the town, at an estimated cost of £26,000 to £27,000.

A new chancel added to the parish church, Ash, near Whitechurch, Salop, in memory of the late Rev. Henry Brunell Finch, for eighteen years vicar of the parish, was recently consecrated.

A stained-glass window has been placed at the east end of the north aisle of the parish church, Bishop's Waltham, by Colonel Bruce Brine, R.E., in memory of three of his children. The window contains three lights. The left has for its principal subject a figure of the Good Shepherd, with the child Samuel in the lower panel. In the centre light there is a representation of the Holy Women at the empty tomb of our Lord, with the raising of the daughter of Jairus in the lower panel. The right-hand light has a figure of St. George and the Dragon, and below it an angel is represented ministering to a fallen soldier on the field of battle. The architects were Messrs. Lavers and Westlake, of London.

BOOKS RECEIVED.

Brunelleschi, by LEADER SCOTT, is one of the series of "Great Masters in Painting and Sculpture" brought out by Geo. Bell and Sons, of which the present volume forms the seventeenth, while ten others are in course of preparation, each book being intrusted to a separate writer. In his preface Mr. Leader Scott admits that it is very difficult to obtain enough data for an authentic life of Filippo Di Ser Brunelleschi. His designs were altered even by those who continued them at his death; his buildings were restored by subsequent architects, and the author believes there are only two works by which his designs can be fairly judged—the Pazzi Chapel and the old Sanctuary of San Lorenzo. The original fountain of information is a certain manuscript, long anonymous, written by a contemporary, from which and from tradition both Baldinucci and Vasari drew their facts. Of the work in the *capella* of Florence we have had a full account since Signor Cesare Gnani in 1887 published extracts from the Archives of the Opera, and the manuscript is no longer an unknown quantity. It was written by Antonio Manetto, a master joiner and architect. Mr. Leader Scott traces the family of Brane Eleschio, gives the scanty facts known as to his youth and education, and then in agreeable fashion he deals with his work as a sculptor and as architect of the great Dome at Florence, and in subsequent chapters treats but he knows to the versatile capabilities as a master of men, as the city architect of Florence, as a church and palace builder, and as a military engineer. A catalogue of his works and documents quoted from form valuable appendices to this reliable and well-planned work, which is illustrated by a medallion portrait of the gifted architect by Andrea da Ugolino, and a number of reproductions of the original graphs of his chief buildings. *The Essex Review* (Chelmsford: Tindall, and Jarrold). The current issue of this well-edited county quarterly well sustains the character already gained. It has as a frontispiece a portrait of Sir Nicholas C. Tindal, successively Solicitor-General and Lord Chief Justice, who was born in Moatsham-street, Chelmsford, and of whom a statue exists in the market-place of his native town. A discriminatory biographical notice of Tindal is written by Mr. W. B. Driffield. Mr. W. W. Glenny gives the second part of a description of the Dykes of the Thames. Mr. Robert Cook writes as an expert on cricket in Essex, and Miss C. Fell Smith treats the unwritten lives of the harvesters in the present day, including the harvesters' rights to rabbits captured in the standing corn during reaping.

The new Wesleyan church, Darlington-street, Wolverhampton, was opened last week. The Georgian style of architecture has been adopted, and the building has been erected by Mr. Lindsay Joseph, of Wolverhampton, from plans presented by Mr. Arthur Marshall, of Nottingham. The exterior is of red brick, amply relieved with stone. The special feature is a large dome, which rises to a height of 100ft. from the basement, and includes an inner dome of decorated plaster work and mosaic. Accommodation is provided for 1,200 worshippers. The total cost has been about £16,000.

Mr. W. T. Dickson, W.S., the arbitrator, has issued notes of his proposed finding in the recent arbitration case, in which Lord Saltoun claimed £11,850 for land lost over the proposed light railway from Fraserburgh to St. Combe will pass. The railway company's witnesses valued the land at between £200 and £300. The arbitrator has awarded between £700 and £800.

The parish church of Newton-in-Makerfield was reopened on Thursday last week after the organ had been overhauled and additions made to it, the work having been carried out by Messrs. W. Rushworth and Sons, of Liverpool.

In view of the recent discussions of the Edinburgh Town Council regarding the acceptance by contractors of contracts for the improvement of the contractors doing public work, the Finance Committee of the Glasgow Corporation have framed a recommendation to be submitted to the town council asking the council to issue instructions prohibiting the practice in every shape or form, as far as Glasgow is concerned.

A service reservoir is being constructed at Winwick, near Warrington, for the Warrington Corporation, having a capacity of over 4,000,000 gal. The main walls, division walls, floor, and roof are all of concrete. The depth is 91ft. by 190ft., with a depth of 19ft. Mr. Deane, the engineer, the contractor is Mr. Geo. Bell, of London and Manchester, and Mr. Neil McK. Barron is resident engineer. The cost will be £25,000.

OBITUARY.

WE regret to record the death of Mr. A. J. B. WARD, the well-known constructional engineer and head of the firm of Messrs. B. Ward and Co., Ltd., 38 and 39, Parliament-street, S.W., the concrete specialists. Mr. Ward, who died on Thursday, the 7th inst., and was buried at St. James's Church, Tottenham, had been ill for a very long time, and prevented from attending personally to business. He was an enthusiast in his work, and a thoroughly capable engineer. He introduced many improvements in the development of fire-resisting construction, some of his methods being exceedingly ingenious and eminently practical. What he understood best was the work of many architects, and he was his will in consequence share the regret and esteem for his memory which we have thus expressed.

CHIPS.

The town council of Leigh, Lancs., have appended their common seal to a memorial to the Local Government Board to sanction the borrowing by the council of the sum of £50,778 for the purpose of erecting a town-hall, borough court, and offices.

A system of electric tramways is being constructed at Barmley by the British Electric Traction Company, and will be opened for public traffic through the borough on August 11, 1902.

Messrs. John Giles, Gough, and Trollope have formally accepted the duties of the Hammer-smith Board of Guardians for the new workhouse and infirmary about to be erected, their plans having received the approval of the Local Government Board. The remuneration is to be at the rate of 4s. per cent.

Mr. F. H. Talloch, an inspector under the Local Government Board, has held an inquiry at Portsmouth into the application of the town council for sanction to borrow £25,000 for purposes of electric lighting, and £26,000 for the establishment of a municipal telephone system in the borough and surrounding districts.

Colonel A. J. Hepper, D.S.O., R.E., one of the inspectors to the Local Government Board, held an inquiry at Rochester last week in respect to the application of the town council for approval for the sale of the site of the abandoned railway, and the issue of such sale towards defraying the cost of the repair and restoration of Eastgate House with a view to its use as a public library and museum. The historic house in the High-street known as Eastgate House, four years ago purchased by the corporation for £2,000, and another £2,000 is to be expended in fitting it up for its new uses.

At the meeting, on Monday, of the Cheltenham Town Council the General Purposes Committee recommended that the tender of Messrs. Collins and Godfrey, of Tewkesbury and Cheltenham, of £29,310, for the erection of a town-hall, be accepted. It was explained that there were two tenders lower than the one proposed, but in the case of the lowest tender, of £28,396, by a Nottingham firm, the council's application for security had been ignored, and of the other, of £28,780, by a Hereford firm, the contractors required 33 months in which to complete the work. Messrs. Collins and Godfrey, however, were willing to complete the contract, under heavy penalties, in 20 months, so as to save Cheltenham going a second season without an adequate hall. In the discussion following an effort was made by one who had opposed the scheme previously to open the question of the cost of the scheme, but the resolution was put and carried by a large majority.

A curious subsidence, involving the partial destruction of the paint factory of Messrs. W. H. Holmes and Son, occurred on Monday in Newcastle-on-Tyne as the result of the falling-in of an old pit-shaft which had been covered up and forgotten. The subsidence began to show itself three weeks ago, and gradually progressed so that on Saturday all the workmen were withdrawn. The subsidence ended in complete collapse. The pavement in the square in front of the factory and the buildings on the square fell into the cavity and disappeared entirely. On the opposite side of the street is a row of dwelling-houses, but this is uninjured. The shaft is believed to have belonged to a pit which was first worked in 1850 and finished in 1882, of which the records were afterwards entirely lost.

The foundation-stones of a new Salvation Army barracks at Great Clacton were laid on Wednesday week. The building is intended to accommodate about 500, and there will be a smaller hall for juniors. The estimated cost is about £13,000.

Mr. H. Percy Bonnois, Local Government Board inspector, has held an inquiry at Birmingham, on Friday, into the City Council's application to borrow £31,600 for purposes of a refuse destructor, stabling, &c., at Rotton Park-street Wharf.

PROFESSIONAL AND TRADE SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The first general meeting of the Associates' section of this body was held in the rooms, 117, George-street, on Wednesday. "Notes on Some of the Cathedral Towns of England" was read by Mr. W. S. A. Gordon. The author, whose paper was illustrated by excellent limelight views, dealt only with the archiepiscopal cities and a town containing a minster. He devoted most of his time to Canterbury, giving a short history of its cathedral from the landing of St. Augustine in England, 597, and closed with brief sketches of York and Beverley.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—The usual meeting of the society was held on Friday evening, the 8th inst. Mr. James McKissack, President, in the chair. Papers were read by Messrs. R. Stuart and D. S. Pringle on "Softwoods" and "Hardwoods" respectively. Each essayist described the growing timber and its conversion into various market forms, with descriptions of many of the trees of each respective class. Such points as the relative durability and price of timber, and the suitability and adaptation of these to various works, were discussed by the members, whose thanks were conveyed to the lecturers.

ROYAL INSTITUTE OF ARCHITECTS OF IRELAND.—On the 4th inst. Mr. George C. Ashlin, R.H.A., of Dublin, was elected President of the Royal Institute of the Architects of Ireland, in place of Sir Thomas Drew, F.R.H.A., who has retired after 25 years' service. A presidential chair for a period of fifteen years.

THE SOCIETY OF ARCHITECTS.—The first ordinary meeting, fixed for Thursday next, the 21st inst., is unavoidably postponed for a week, to Thursday, the 28th inst., at 8 p.m., when the president, Mr. Silvanus Trevail, F.R.I.B.A., will give his inaugural address.

Plans for a new hospital for women and children at Leeds have been prepared by Mr. J. W. Connor, of Leeds, and Messrs. Chorley, Connon, and Chorley, and the tenders list £24,000 will be required to build and equip a new structure with accommodation for about fifty beds, and a new outpatient department, and to adapt the existing building to new uses, and towards this sum £19,000 is in hand.

On Saturday, the Bishop of Stepney opened and dedicated the new wing at St. Hilda's, Bethnal Green, the settlement worked by the Cheltenham Ladies' College. The addition consists of some classrooms and a hall for club purposes, built in memory of Mrs. Moyle.

In consequence of the inroads of the sea at New Romney and Littlestone-on-Sea, the land defence authorities, in order to save the rich pasture land from being inundated, have decided to expend between £15,000 and £16,000 in constructing a sea-wall similar to that at Dymchurch. One part of the wall will have to be constructed along the Grand Parade at Littlestone.

The City Council of Westminster have accepted a memorial portrait of the late Duke of Westminster, painted by Mr. William Carter. The portrait, which was exhibited at the Royal Academy this summer, is to be placed in the Public Library, Buckingham Palace-road, which stands on a freehold site, the gift of the late Duke.

Mr. Edmund Wickens Fry, architect, till lately in practice at Dover, where he carried out several new hotels, has left for Canterbury, aged 65 years.

Gorbals Public Library.—The first of a number of district libraries established throughout the city by the Corporation of Glasgow, was opened on Monday. The library is placed in the first and second floors of the Corporation Baths building in Main-street, Gorbals. The first grade in respect of extent, fittings, stock of books, and service. The hall on the first floor has been fitted up as the lending department, with a portion set apart for a boys' reading-room, the latter apartment being fitted with desks and seats similar to those used in public schools, and given accommodation for about ninety readers.

At the last meeting of the housing of the working classes committee of the city council of Bath the city surveyor, Mr. Fortune, reported that up to date £1,174 had been spent on raising the rateable value of the houses of the Dolmetsdale Buildings, and on the houses the contractor had been paid £4,500. Of the 40 houses to be erected, 35 were built, and they were all occupied as soon as ready.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many demands upon the space allotted to correspondents.

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 6, Dale-street, Liverpool, (in the case of the Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risk, and the Editor will not undertake to pay for, or be liable for, inexact contributions.

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Correspondence.

LIVERPOOL CATHEDRAL.

To the Editor of the BUILDING NEWS.

SIR,—The thanks of the entire body of architects are due to the Press for its powerful help in the cause of architecture generally, even more than in that of the Liverpool Cathedral in particular. By opening its columns to a discussion of the original conditions of competition issued by the Liverpool Cathedral Committee, and to the protests made by architects against the conditions, it claims to prevent freedom of thought and expression amongst those who should submit designs for the cathedral, it has done much to obtain a better appreciation of architecture.

The withdrawal from the Liverpool Cathedral Committee of the first conditions of competition, and the issue by them of amended conditions, wherein the word "Gothic" is omitted, is a great act of moral courage which will have far-reaching effects. Indeed, it does not seem to be surprising if that act of the Cathedral Committee there should be a very general recognition of what architecture truly is, and that of building, and the science of reproduction. But the committee must take a further step if the Liverpool

Cathedral is to be all that it might be. They must, in fact, boldly abandon all idea of using the cheap and make-shift site of St. James's Mount, and they must take their all upon the site first selected—viz., that of Monument-place. They are already possessed of sufficient funds to secure the latter site, even if not to take commensurate building operations; but even as a magnificent site would inspire architects to magnificent architecture, so would it inspire those to do so who are able to provide the means for its realisation.

The relative merits of the two sites are well understood in Liverpool, and as they were made known by my letter in the *Times* of the 8th ult., it is unnecessary for me to add references thereto. But that a very strong opinion is rapidly growing throughout the country as well as in Liverpool in favour of the adoption of Monument-place site, there is no doubt whatever; and the cathedral committee must be fully aware that such is the fact from the practical cessation of contributions towards their St. James's Mount site scheme. The committee would, therefore, only be far-seeing and wise to note the trend of popular opinion, and to launch a new and bolder scheme without delay.

It would perhaps require a greater moral courage that the committee have already evinced to issue further amended conditions of competition; but the success of the competition, nevertheless, demands that even this step should be shown. For, under the present conditions, there will be held a competition for a cathedral to be erected upon an unknown site, upon unknown foundations, with unknown levels to be dealt with, and for unknown accommodation; and the drawings in explanation thereof may be drawn to various scales or on different materials, in ink or pencil, and may be uncoloured, and may be further illustrated by perspective views or by photographs; and, moreover, the designs may represent ideals or accomplished facts. From this heterogeneous mass of information, to which the whole world is permitted to contribute, the cathedral committee must select a design which of its competitors may or more, is to be adjudged by them to submit further designs for the cathedral; and the committee will pay the sum of three hundred guineas to one or more competitors.

If they decide to hold a second competition—for a second cathedral, it is to be efficient preparation must involve an expenditure by each competitor of from eighteen months to two years of time and thought, and some £500 to £600 of expenses. Surely it must be very obvious that such a form of competition will not only fail to call forth the best possible design, but will also result in a costly and contradictory expenditure, which their professional advisers would be quite powerless to extricate the committee, I am, &c.

T. MYDDLETON SHALLCROSS.

6, Dale-street, Liverpool, Nov. 9.

KEW COWL TESTS.

SIR,—Re the controversy which is at present raging over these tests, and which so far seems unanimous in their condemnation, perhaps the following extracts from the *Councillor and Guardian* and the *Contract Journal* may be enlightening. The former journal says:—

In 1877 the Sanitary Institute utilised themselves in the case of the cathedral by publishing a report on ventilation, based on a series of tests, which were pronounced by entirely competent and unbiased judges to be valuable, and which, under the management of the late Mr. Rogers Field, to whom was personally intrusted the conduct of the investigation, were commonly they were in the hands of a committee. Now, whatever reputation he may have enjoyed in other realisations of sanitary science, the manner in which he pursued these investigations was alone sufficient to prove that his knowledge of the science and practice of ventilation was inadequate for the work he was undertaking, for which he was further disqualified by having to pass a judicial opinion upon the inventions of his rivals in the sanitary engineering department. This has now been published by the Sanitary Institute, as a memorial to Mr. Field, a further report on cowl tests, made by him and his assistants, during a series of five years, and the objections urged against the earlier report may be urged with no less justice against their later one. It is significant that the results would be scientific, and the palm for efficiency to a cowl or terminal of which the Sanitary Institute themselves hold the patent—a result which was so difficult to obtain without the method of experimenting was exactly such as to favour the cowl in question, or the open-pipe principle. The report devotes particular attention to the apparatus, while other, equally worthy of attention, are dismissed with a scanty notice. Indeed, the spirit of the seeker after truth does not appear to have animated Mr. Field, who, vexed by the manner

in which his first tests had been received, expressed his determination to "confound" those critics who had condemned his report.

Whether the work may have any historical value, or serve its purpose as a memorial to Mr. Field, we do not profess to say. That it has no practical value may safely be asserted, if only for the simple reason that it does not cover the up-to-date ventilating appliances now on the market. To this consideration must be added the fact that there was no adequate test of older and approved forms, and that the investigations being conducted in secret, the makers of the various appliances had no opportunity of ascertaining themselves the conditions of the tests were just or such as their various appliances were respectively designed for.

If the Sanitary Institute wishes to retain the confidence of the public, it will have to withdraw its memorial to Mr. Field, and the only likely to give an equal prominence to the telling criticism.

The *Contract Journal* expresses its opinion as follows:—

It may, however, be said that they have done too much. Instead of simply laying down the lines upon which, as an outcome of their tests, it was advisable to construct these cowls and to show what should be avoided on the one hand and what should be provided on the other in order to give the best possible results, they have given their imprimatur to three specified models, which they have patented. We hasten to say that these patents were taken out by the Sanitary Institute, and that it is the intention of the Institute to let the public have the free and full use of the same. Yet the fact remains that a scientific and public authority has committed itself to a statement that here we have the three best types. This might have been all right, if it were not for the fact that, as possible, which we maintain, is not the fact in this instance. Improvements are possible, and improvements will be made, and it is to be hoped that the Institute tries to bring his product upon the market the chances are very much that he will be confronted with his big report and a refusal to accept of the same, and will be informed to the standard type proclaimed by the Institute.

It will doubtless come as a great surprise to many, this astounding admission of the Sanitary Institute, that they themselves are the patentees and proprietors of the cowls alleged in the report to be the most efficient—though Professor Shaw, the compiler of the report, does not endorse this conclusion. It almost passes credence that, as this matter stands, the Sanitary Institute do not see the extreme impropriety of their position, which is an untenable one, and completely nullifies the value of any decision emanating from them on this matter, which they have taken upon themselves to judge. More particularly so when they have given their verdict in their own favour. The gross injustice of such a proceeding to other ventilator makers who, by their efforts, have created the present public interest in the question of ventilation, and who have been referred to, particularly after Professor Shaw has condemned the tests as valueless; but I should have thought that it formed no part of the mission of the Sanitary Institute to discourage such efforts, particularly in an endeavour to add to its own importance, and to be considered as a superior authority in the matter, which it has shown that at the most it merely possesses that little knowledge that "is a dangerous thing."

Surely nothing like this has ever been known before in the annals of scientific research, and the consequences to the Institute may prove incalculable.

To prevent any possibility of mistake or misunderstanding, perhaps the Council of the Sanitary Institute will reply to the following questions, as it is just possible that some too-enterprising official of the Institute has allowed his zeal in this matter to outstrip his discretion, and that the Council themselves are not wholly responsible:—

1. Was it with the full knowledge and sanction of the Council that the patents for the cowls in question were taken out?

2. Why, if no monopolistic rights were intended, and the public were to have the free and unrestricted use of these cowls, was the useless expense of patenting them incurred?

3. Why is there not the slightest mention of all this in the report?

4. Is it true that an agreement exists, or ever existed, between the Sanitary Institute and the assistant who arranged, and carried out the tests with these cowls, to pay him a royalty on their sale?

It remains to be seen if the Sanitary Institute, after the universal condemnation of these tests, and of the methods by which the results were attained, also the statement of Professor Shaw in the Report that the relative values of the cowls, terminals, and tubes had not been proved, and that the tests did not correctly represent particular forms of cowl, and that the tests will persist in representing the cowls (which appear from the illustrations to be merely old forms and modifications of the open pipe with rain caps) as

having been proved by these tests to be the most efficient, or will allow its *imprimatur* to be used in connection with them.

May I be allowed to suggest that the Institute should take counsel's opinion as to whether to do so would be illegal, as such a proceeding might be looked upon, after Professor Shaw's verdict, as a case of "false representation" and an attempt to mislead.

As the ventilators against which the Institute tested their terminals were what are now obsolete forms—and merely models at that, which prove nothing, as was known to Mr. Field—it would most undoubtedly be misleading to assert that the Institute's cowls had been proved by these tests to be the best in the market at the present time, seeing that the improved forms of ventilators now in use were not included in the tests at all.

Surely the Sanitary Institute is not in such desperate straits that it requires to resort to such tactics to keep its name before the public, and gain notoriety, which, as I understand these tests, seem to have been their principal object. At any rate, it would not be conduct such as one expects from a society occupying the position held by the Sanitary Institute. The Sanitary Institute should have been satisfied with the verdict of the *Times* on the first instalment of the report, when it said:—

The method of testing was incorrect, and, therefore, the tests are valueless. Neither in the case of either of the cowls or the tubes was their true value as extractors ascertained.

The Sanitary Institute have certainly no right to complain of the outburst of indignant protest which the publication of this report has called forth. They have deliberately brought it upon themselves; though I cannot bring myself to believe that the Council of the Institute have been wholly to blame in the matter, and judgment, so far, at least, as they are concerned, ought to be suspended until they have replied to the questions which have been put.

Judging from the names and reputations of the gentlemen forming the Council, and my own personal knowledge of a number of them, I should say that they were the very last in that world to knowingly countenance anything having the slightest suggestion of "shadiness."—I am, yours, &c., ROBERT BOYLE.

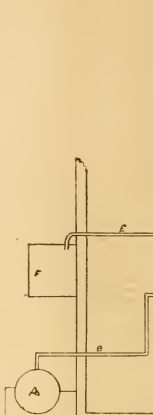
64, Holborn Viaduct, E.C., Nov. 9.

P.S.—I have just seen in a publication an enlarged drawing of the Sanitary Institute's "champion" cowl, and find that it is nothing more nor less than an exact replica of an old chimney-cowl that was first made by me over thirty years ago. That being so, I am afraid the Institute's test is not worth the value of the paper the specification is printed on. As it is now "many years ago" since I made "a gift to the nation" of this cowl, it would appear that the Institute have been somewhat forestalled in their proposed "benefaction." I have notified the Sanitary Institute of this discovery, and intimated that if they care to send a responsible person who understands something about cowls to 64, Holborn Viaduct, I will show him drawings and models of this cowl, and also the cowl itself, besides several other modifications of cowls on the same lines. In large sizes, for several reasons arrived at from actual practical experience (which reasons the Institute appear to have either ignored or to be ignorant of the application to their cowl). I never considered this chimney-cowl good enough to make a ventilator of, and I think that the Sanitary Institute would have arrived at the same conclusion if they had made the tests with full-sized specimens, such as are used for the ventilation of buildings, instead of with models, as was done.—R. B.

Entercommunication.

QUESTIONS.

[11890.]—**Heating Arrangement.**—The accompanying sketch shows a heating arrangement, and it is desired to run the condensed steam back into boiler. What is the simplest arrangement? Boiler pressure is 14 lb. per square inch. Lift from bottom of boiler. Boiler if fed direct from street main dispenses



with a pump or injector. A, boiler; B, steam-pipe; C, steam coil; D, hot-water tank; E, waste pipe; F, steam trap outlet (running into sewer).—M.A.T.

[11895.]—**Forms of Specifications.**—Are there any lithographed or printed forms of specifications published with blanks left for special descriptions, &c.? Such would be a boon to busy architects, as much time would be saved by their adoption.—ARCHITECT.

[11896.]—**Labours on Stone.**—Will any experienced mason describe the labours on granite, Portland stone, and Bath stone, and what they consist of; also the relative cost of the operations?—A. G.

[11897.]—**Concrete for Arches.**—Is it possible to form a segmental arch of concrete left, span and about 2 ft. rise, over a basement, and what should be the composition of the concrete? Will such an arch carry the ordinary load of a dwelling-house floor?—LEARNER.

[11898.]—**Overcrowding Water-drains.**—A house in the southern suburbs of London is overcrowded, and no proper water-fittings exist. Under what Act can the informant proceed to abate the nuisance? Will any one of your readers give the section of the Act, or quote the same?—MEDICAL.

[11899.]—**Gladstone's Statue for Westminster Abbey.**—Who was the sculptor selected by the Government to execute the contemplated statue of the late W. E. Gladstone, for the north transept of Westminster Abbey? Is there any probability that the work will be finished before the Coronation celebrations next summer? I sincerely hope the figure will be a better portrait likeness than the unhappy one of John Bright, by a living R.A., shown for a short time in the lobby of the House of Commons, and so promptly, peremptorily, and justly condemned by all who knew the People's Tribune.—EAST ANGLIAN.

[11900.]—**Perpendicular Work.**—Will someone kindly tell me what books there are published on Perpendicular work (with examples)?—PEAR.

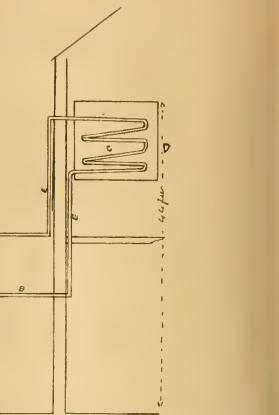
REPLIES.

[11891.]—**Exam. for Inspectors of Nuisances.**—I should advise "P. H. A." to get "A Practical Guide for Sanitary Inspectors," by Frank Charles Stockman, A.S.I., published by Butterworth & Co., Bell-yard, W.C., and noticed in the *Builder's News* last year. It comprises all the principal matters that fall to the sanitary inspector, the appointment of sanitary inspectors, his duties, qualifications, manner of making inspections, and the various nuisances, festering drains, infectious diseases, disinfection, food inspection, common lodging-houses, dairies, bakeries, &c., are noticed, and the sections of the Acts, including a summary of the Public Health (London) Act, 1891, are given.—G. H.

[11893.]—**Street Improvements.**—If "A Citizen" can bring evidence of the damage done to party-wall, and loss of business, caused by the demolition of buildings in the immediate vicinity of the premises in question, he might have a case against the authorities; but the damage done must be of a material kind that can be proved. No mere discomfort of occupants or imaginary damage would be considered. I cannot refer to any actual cases of the kind. I should advise "A Citizen" to bring the matter before the Improvement Committee of the Corporation.—C.

COMPETITIONS.

CARNEGIE LIBRARY, HAWICK.—At a meeting of Hawick Town Council on Friday, the report of the arbiters (Mr. James Barnett, F.R.I.B.A., Glasgow), on the plans for the new Carnegie Library was submitted. He stated that he had examined the forty-two competitive plans sent in, and after making a short list of nine had chosen the one marked "Quex" for the first premium



of £100, and the one marked with a red star-shaped seal for the second premium of £50. These, he considered, would come within 10 per cent. of the cost allowed, or, say, £7,700. The council did not divulge the actual names of the architects, but remitted the matter to a committee. Mr. Carnegie's gift was £10,000.

LAHORE GENERAL POST-OFFICE.—In the competition for designs for a façade of the new General Post-office, Lahore, for which there were thirty-one competitors, the Punjab Government has awarded the first prize to Mr. E. Thornton, chief architect to Messrs. Martin and Co., of Calcutta.

CHIPS.

The urban district council of Brentwood have resolved, subject to the approval of the Local Government Board, to expend about £5,000 in the erection of workmen's dwellings and £2,000 in building a fire-station.

The Dover Municipality, by a large majority, have decided to apply for powers to purchase the electric light works for the borough, the electric trams being already the property of the ratepayers. The price agreed upon is £129,000.

The engineering works of the Low Moor Iron-works Co., near Bradford, were destroyed by fire on Saturday. The damage is estimated at nearly £30,000, and is covered by insurance.

Mr. Gerald Moira has just completed the decoration for the ceiling in the new Unitarian Church, Ullt-road, Liverpool.

At Saturday's meeting of the town council of South Shields, Alderman Marshall offered a strong protest against the recent decision to limit the expenditure on the proposed new municipal buildings to £35,000. The site in Ogle-terrace was a noble one, and the proposed outlay was utterly inadequate to the position and the requirements of the town.

General regret will be felt for the death, at the age of 35, of Miss Kate Greenaway, R.I., which occurred at her house at Hamptonstead on Wednesday week. No illustrator of children's books has ever taken so strong a hold upon the appreciation of the public. Miss Greenaway's picture-books were pioneers in the modern "art for children" movement, while her powers of draughtsmanship were great.

The Mansion House is to be fitted with a passenger lift, and the contract has been given to Messrs. R. Wyngood and Co., Ltd.

Lord Avelbury formally opened, on Friday, a new free library in William-street, Woolwich, which had been started by the old Woolwich Board of Health and completed by the new borough council.

The proposals to raise £72,000 for the purchase of the Marble Hill Estate at Petersham from Lord Lever, so as to preserve the amenities of the view from Richmond Hill, seems to be in a fair way towards successful realisation. On Tuesday, the London County Council agreed to vote £36,000 towards this object, and the Surrey County Council another £10,000. It is suggested that the remainder of the money be provided as follows:—Middlesex County Council £12,000, City Corporation £5,000, Richmond Corporation £5,000, Twickenham Urban District Council £3,000, and the Hammersmith Borough Council, £1,000.

Engineering Notes.

ELECTRIC TRACTION FOR SOUTH LONDON TRAMWAYS.—A commencement with the reconstruction of County Council tramways on the south side of the Thames is about to be made. Although the lines have not yet been interfered with, all arrangements have been signalled, and the contractors are busy getting the plans on the scene of intended operations. Messrs. J. G. White and Co., which is a partly American and partly English enterprise have secured the electric work for a total of £171,115, and they have engaged themselves to finish within thirty weeks for the summer of 1902. The fastenings the tender of Messrs. Walter Scott for £23,334 has been received. That, however, was not the lowest tender. Messrs. Bulcock, Vaughan, and Co. offered to supply the same material at £25,524, but as Messrs. Scott also undertook to include the slot rails, conductor tees, and fastenings in their lot, the Cleveleys railway made no offer for these, it has been thought best to give both to Messrs. Scott, seeing that the two sets of work are so intimately connected with each. The contract taken by Messrs. Dick Kerr and Co. for the generation plant for the first section of these electric tramways from Kennington to Balham is the largest yet placed in this country, approximating, as it does, to 20,000 horse-power. Orders for this kind of machinery have, heretofore, always gone abroad. Foreign competition in this particular case was very keen, 372 tenders, in all, having been sent in, of which half were from German and American firms. The conduit system is to be adopted, and the lines to be converted in the first instance are those from Westminster Bridge to Tooting, and from Blackfriars Bridge to Kennington Gate, and from Waterloo to St. George's Circus, thus completing the three systems from Tooting to the three bridges over the Thames.

HARBOUR WORKS AT ABERDEEN.—The works carried out at Aberdeen Harbour during recent years are described in a report which Mr. R. E. Nicol, C.E., the engineer, has prepared for the information of the committee. Since 1895, Mr. Nicol mentions, new works and extensions have been commenced, and are now completed or in progress, involving an expenditure of £272,371, whilst the reconstruction and enlargement of the graving dock, to be commenced shortly, will increase this amount to about £398,000. But there are other important works urgently needed at present, for which borrowing powers were obtained in 1899, so that the probable expenditure on new works and extensions during the fifteen years ended in 1910 will amount in all to about £370,000. Though the expenditure on the new works and extensions from 1896 to 1900 was £31,073 in excess of that in the previous five years, the cost of management and maintenance was less by £11,924 than in the period 1891 to 1895. The deepening and maintenance of depth in the navigation channel and harbour works that have to be faced are standing costly in keeping the port abreast of the requirements of shipping. These operations, including the cost of new dredging-plant, have involved an expenditure of £249,000 during the last thirty-two years.

SWINDON AND SOUTH WALES DIRECT RAILWAY.—Good progress is being made by the three thousand navvies in the employ of the Great Western Railway Company in the construction of the Bristol and South Wales Direct Railway, the first sod of which was cut on November 29, 1897, by the Dowager Duchess of Bouffler. It provides a shortened route between South Wales and Swindon, avoiding the present deep southern loop via Chippenham, Corsham, Bath, and Acornham. The new line begins at Wootton Bassett, proceeds westwards to Maidenhead, and Somerset (where it crosses the branch to Malmsbury), Hall Langton, Badminton, Sodbury, and Winterbourne (with stations at each of these places) to Filton, on the Severn Tunnel route, whence it runs north of Bristol, a spur line northwards connecting with it at Fatching. From an engineering point of view, this is a difficult some of the chief works being the tunnels and cuttings under the Cotswolds at Chipping Sodbury, and Stoke Bishop, and viaducts at Hackford and Winterbourne. Mr. W. W. Grierson, M.I.C.E., is the resident engineer.

LEGAL INTELLIGENCE.

WORKMEN'S COMPENSATION ACT APPEAL.—THE THIRTY-FEET LIMIT OF HEIGHT.—(McGrath, Applicants, v. Robert Neill and Sons, Respondents.)—Sitting in the Court of Appeal on Friday, the Master of the Rolls and Lord Justices Stirling and Matthew delivered judgment in this case, of much interest to builders. It was an appeal by the respondents, Robert Neill and Sons, from the decision of the Under-Secretary of State for the Colonies in arbitration under the Workmen's Compensation Act, 1897. The applicant for compensation, Christopher McGrath, a workman in the employ of Robert Neill and Sons, was injured while working in the course of his employment. He was at the time of the accident employed on a building which was being constructed, and the question was whether his building, at the time of the accident, exceeded 30ft. in height, within section 7, sub-section 1 of the Workmen's Compensation Act, 1897. This depended upon the rule to be applied as to the proper point at the bottom of the building to be measured from. The building was a brick building, and was built from the bottom of the footings above the concrete foundations to the top of the building was 33ft. 2½ in.; from the top of the footings to the top of the building 31ft. 6 in.; from the basement floor to the top of the building 10ft. 6 in.; and from the top of the street to the top of the building, 23ft. 5½ in. There was some evidence that at the time of the accident the footings were covered in. The County-court Judge held that the proper measurement was from the bottom of the footings, and as this measurement gave a height of 33ft. 2½ in., he awarded compensation to the applicant. Mr. Maxwell Stark, for the employers, contended that the proper point to measure from was the level of the ground, where the foundations, &c., were covered in. The part covered in was not part of the height of the building. To ascertain the height of the building, he contended, the part below the ground level should be taken into account. The basement floor was covered in. The ground-level was the proper part to measure from. It would be very inconvenient to have to dig down below the ground to find out the height of a building. He referred to a *Halsbury v. Thompson and Sons*. Mr. McCleary, for the applicant, was not called upon. The Court dismissed the appeal. The Master of the Rolls said that it had been pointed out by this Court in *"Billings v. Holloway"* (1899) that the height of a building must be ascertained at the time of the accident. Did this building at the time of the accident exceed 30ft. in height? It seemed to him that the question of it was not a question of fact, provided there was evidence to support the finding. His Lordship agreed with the County-court Judge that the provision as to the height of the building applied to all buildings, whether they were old buildings or new buildings. As Lord Macnaghten said in *"Hodgkiss v. Newton, Chambers, and Co."* (1901), the provisions as to the height of a building and as to scaffolding "were intended to exempt a certain class of buildings, and perhaps a certain class of builders of the humble sort, from the operation of the Act." It was obvious that a building might be a building of importance, though it was a building of the humble sort, and it could see no evidence that there was more than a flooring at the top of the footings. The presumption from the evidence was that the flooring at the time of the accident had not got beyond the ground level. In his opinion, therefore, the height of the building must, in this case, be measured from the top of the footings, and being so measured, the building at the time of the accident exceeded 30ft. in height. Lord Justices Stirling and Matthew concurred.

ANOTHER APPEAL AS TO THE THIRTY FEET LIMIT.—The Master of the Rolls and Lord Justices Stirling and Matthew also heard the case of *"Alice Knight (Applicant) v. Wm. Cabitt and Co. (Respondents)"* an appeal by the respondents from the decision of the County-court Judge at Brompton. The applicant was a widow of a workman named Knight. The respondents, the well-known firm of builders and decorators, had erected a building, and the applicant, Messrs. Woodland, of Knightsbridge, whereby they agreed to demolish and reconstruct two houses, Nos. 16 and 17, William-street. Messrs. Cabitt and Co. were their usual practice, since the pulling down of the houses to a housebreaker named Clements, who was, subsequently, made a third party to these proceedings, and Knight was one of the men Clements employed to assist him. At the time of the accident, the walls were more than 30ft. high, but at the date of the accident the walls were not standing more than 11ft. or 12ft. from the road level, with the exception

of the party-wall. The appellants in this Court contended that as they were builders, the work of demolition was not incidental or ancillary to their business as an architect and decorator, and that, therefore, they were not liable as "undertakers." Moreover, they said the building was not 30ft. high at the time that Knight met with the accident. The learned County Judge, in giving judgment in their own behalf, held that the building was more than 30ft. high at the time of the accident. The Court, with out hearing counsel for the applicant, dismissed the appeal.

IMPRACHTABLE REGULATIONS BY THE LONDON COUNTY COUNCIL.—THE CONSOLIDATED PROPERTIES COMPANY v. THE LONDON COUNTY COUNCIL. The Consolidated Properties Company v. the London County Council, an appeal by the Consolidated Properties Co., of 112, Queen Victoria-street, against a conviction on the prosecution of the County Council for non-compliance with an order of the County Council, which was made in consequence of communicating with all the floors of the appellants' premises, so as to provide means for the safety of workpeople, was heard on Wednesday by Mr. Justice Ridley and Mr. Justice Bigham. Mr. Bray, K.C., in support of the appeal, stated that notice to provide a staircase was served upon the appellants by the County Council under the Factory and Workshops Act, 1891, which contained certain provisions applicable to a staircase, and that the object being to provide ready means of escape for workpeople in case of fire. The County Council notice required a new staircase to be erected from the ground to the top story, communicating with the floor above, and that the staircase facility in the way of the appellants, who were anxious to comply with the order, was that the ground floor and basement of the premises were let to tenants who were not using them as a factory, and who declined to allow the appellants to interfere with those floors for the purpose of constructing a new staircase. It was, therefore, impossible to comply with the order. The Metropolitan Magistrate, who heard the case, and Mr. Justice Bigham, refused to hear evidence on the point, and convicted the appellants, saying that the question whether the appellants could comply with the order or not should have been to arbitration. The appellants said, "Very well, we will go to arbitration," and accordingly the question was submitted to two experts, who had made a report which was perfectly satisfactory to the appellants. They recommended that a single outside staircase be brought down to the ground floor, and then that two inside staircases be utilised and made fireproof; that all doors should be made to swing both ways, and that all gangways should be made to swing both ways. The appellants were willing to carry out the recommendations of this report, which were made by two eminent gentlemen, and this being so, he asked the Court to quash the conviction. Mr. Horace Avory, K.C., in support of the County Council, submitted that the conviction ought to be affirmed, as the award of the arbitrators stated that the notice served by the County Council to provide a new staircase was a reasonable and proper notice to order for the safety of the workpeople. The section of the Factory Act under which proceedings were taken provided that in case of reference of opinion between the Council and the award of the arbitrators, the matter was to be referred to arbitration; but, though notice was first served in October, 1899, and the appellants were convicted in March, 1900, the appellants did not appeal from that conviction, or suggest then that it was impossible to comply with the order. But, after that date, the appellants took proceedings against their tenants for contributions towards the cost of making the staircase orders. In May, 1900, the County Council was ordered to give them another three months. That request was complied with, but nothing was done, and it was not till February in this year that they intimated that they could not comply with the order, and asked for a reference to arbitration. He submitted that the objection was not a *bona fide* one, and that the conviction ought to be confirmed. Mr. Justice Bigham: I do not think that was a *bona fide* one, and I have no objection if they have perfect right to make. I think the magistrate ought to have heard the appellants' evidence. Mr. Justice Ridley: So do I. Mr. Horace Avory: That would be to convert the County Council's proceedings into a Court of Arbitration, which was evidently not the object of the Legislature. After some further discussion, Mr. Justice Bigham said that, in his opinion, the appellants had not complied with the order, and that it was impossible to comply, and, therefore, the conviction ought to be set aside; but as the appellants ought to have asked for arbitration before the matter went before the magistrate, and that the County Council costs, Mr. Justice Ridley concurred. The appeal was accordingly allowed, and the conviction quashed, but without costs.

ANCIENT LIGHTS.—WARREN V. BROWN.—In the Court of Appeal on Wednesday, before the Lord Chief Justice, Lord Justice Long, Lord Justice Williams, and Lord Justice Romer, judgment was given. This was an appeal from the decision of Mr. Justice Wright, reported in 1900, 2 Q.B. 722,

and in the *Times* Law Reports, 549. The action raised a question of great importance to owners of town property, with reference to "ancient lights"—namely, whether the right to light which is acquired by statutory prescription is an absolute right to the continuance, for any purpose whatever, of substantially the whole quantity of light which has come to the windows during the statutory 20 years, or whether the right is limited to such a quantity of light as is sufficient for all ordinary purposes only of inhabitation or business. There is a considerable body of authority in favour of either proposition. The facts of the case were shortly these. Two of the three plaintiffs were the owners, and the third was the lessee and occupier, of a factory in a street in the town of Leicester. In the factory, in the fact, had been a hosiery manufactory. In the factory, which was built in 1860, there were windows which had, down to the obstruction complained of in the action, enjoyed the access of light in greater quantity than was necessary for ordinary purposes. From 1860 to 1884 the factory was used as a boot and shoe factory—a purpose which required only an ordinary amount of light. From 1884 downwards it was, with a few short intervals, used as a hosiery manufactory. The manufactory required a considerable degree of light, especially during the time before the obstruction complained of, owing to improvements in the kind of machinery employed, which rendered necessary a very exceptional quantity of light. The manufactory required, and accurate adjustment of filaments to fine needles moving by machinery at speed in bundles of some hundreds. In 1899 the defendant, who had an old building on the opposite side of the street, began to build a new building, considerably higher than its original height, and so diminished the light through the plaintiffs' windows, though still allowing the passage through those windows of enough light for all ordinary purposes. The plaintiffs claimed that they were entitled to have preserved to them the whole of the extraordinary amount of light their windows had received during the statutory 20 years, although that extraordinary amount of light had been actually required for the hosiery business during a very small part only of the 20 years. The defendant, on the other hand, contended that the plaintiffs, as owners of ancient lights, were entitled to so much light as was necessary for the ordinary purposes of the manufactory. The action was tried last year at Leicester, by Mr. Justice Wright, without a jury, and, owing to the conflict of authority, his Lordship, at the conclusion of the arguments, reserved judgment. In the result, his Lordship gave judgment against the plaintiffs, and held that the plaintiffs had suffered substantial damage, and he assessed that of the tenant at £100 and that of the owners at £200; but adopting the law laid down by the Court of Appeal in *City of London v. Mayor, &c.* (1869), and *Reynolds v. City of London* (1870), his Lordship held that as the plaintiffs had an abundance of light left for all ordinary purposes of inhabitation or business they were not entitled to the manufactory injunction. Consequently, the ground on which their extraordinary use had been interfered with. His Lordship added, "Unless, indeed, there is some such limitation of the right to light for ancient windows, it is difficult, as Lord Halsbury said in *Reynolds v. City of London* (1870), to see how the ordinary extensions and improvements of towns could be carried on. If every house which has existed for twenty years is entitled to have all or substantially all the same light come to its windows as during the twenty years, no new houses could be built opposite to old ones unless at a distance which would impose on servient tenements an unreasonable burden, and night would give grave public inconvenience." From this decision the plaintiffs appealed. Mr. Hago Young, K.C., and Mr. W. H. Stevenson were for the plaintiffs; and Mr. Warrington, K.C., and Mr. A. Neilson for the defendant. At the conclusion of the arguments, on October 10th, the Court reserved judgment, which was delivered on Wednesday, allowing the appeal. Lord Justice Romer delivered the judgment of the Court (the Lord Chief Justice, Lord Justice Vaughan Williams, and Lord Justice Macnaghten concurring). His Lordship has found that certain of the plaintiffs' ancient lights have been substantially interfered with by the defendant's new building. He has also found that the plaintiffs have, in fact, thereby suffered substantial damage, and he assessed their losses, as to the tenant at £100, and as to the reversioners at £200. On these findings one would have expected judgment entered for the plaintiffs; but the learned judge has made an additional finding, and by reason of which he has dismissed the action. This finding is to the effect that, notwithstanding the substantial diminution of the ancient lights caused by the defendant's new building, abundant light remains for all ordinary purposes of inhabitation or business. We felt some doubt at first as to what this additional finding meant, and whether it was not contradictory to the other findings; but after further consideration of the judgment, and after consulting Mr. Justice Wright, we have no doubt

as to the meaning of the additional finding. It means that, though the light coming from certain of the ancient lights has been substantially diminished, and though the rooms thereby lighted have become so darkened that both the tenant and the reversioners have suffered substantial damage, yet the darkened house is still as useful for purposes of habitation or business as what we may term the average run of houses. In other words, the Judge appears to think that the matter of light, and that of a standard in the matter of light, and that if a particular house is by its ancient lights extremely well lighted, those lights may with impunity be substantially interfered with, so long as the result is that the house is not left below the standard. In our opinion that is an erroneous view of the law. We do not propose to go through all the numerous cases which were cited before us, but we do so for the purpose of this case. No doubt, before *Kelk v. Pearson* (L.R. 6 Ch. 809) was decided, and still more so before the judgment of Lord Cranworth in *Yates v. Jack* (L.R. 20 Q.B. 293), some inferences as to the nature of the right to light acquired under the statute were entertained and expressed by various Judges; and in some of the earlier cases, and, indeed, even in some of the later ones, language has been used which might have been taken to support the view of the law taken by Mr. Justice Wright. But we think that in recent times the law has become settled, and we propose to state shortly, as far as we can, what we understand the law to be. The statute in its terms might appear to sanction the view that the right to light once acquired was absolute as to every interference with it, and it was so held, at least in part of it, so that any interference, however slight, would be wrongful. But it is now established that the right has not altered the character of which it could be acquired; and it was held that the right would not be interfered with by the light such as to do substantial damage to the tenant or owner. And, in considering what would be a substantial diminution and substantial damage, it is held that what would be a substantial diminution or as substantial damage, but to the views of persons of ordinary sense and judgment. And, in particular, in considering whether a house has been interfered with, it is proper to have regard to the ordinary uses by way of habitation or business to which the house has been put or might reasonably be supposed to be capable of being put. We do not say that in the recent cases the law has been stated in the language we have used; but we mean that, though various expressions have been used by different judges, yet in substance, and as the result of what are now regarded as binding authorities, the above is the law. With regard to the question of the gathering from those judgments which are now to be regarded as sound. And at the present day, if ancient lights are interfered with substantially, and real damage is done to the owner, or to the tenant or reversioner, the owner is entitled to relief. With regard to the exact point arising in this case, we think that, since the case of *Kelk v. Pearson*, it is impossible to hold properly that the statutory right is not interfered with merely because to some supposed standard as to what a house ordinarily requires by way of light for purposes of inhabitation or business. Some houses, owing to their having numerous windows, or particularly ancient windows, are extremely valuable for purposes of habitation, or of business. In these cases an owner of the servient tenement cannot justify a substantial interference with those lights, or, if he does, he is liable to the owner of the dominant tenement causing great damage to the house, on the ground that other houses in the neighbourhood, or even the majority of those houses, or some imaginary standard house, are or is not better lighted than the injured house. Nor is the fact that, owing to the house being very well lighted, certain special businesses requiring much light are being or can be carried on, to be wholly disregarded in considering the effect of the interference. It is merely the fact that the interference other businesses not requiring much light can be carried on. Yet it is to an opposite conclusion that Mr. Justice Wright appears to have come. Immediately after dealing with regard to the room on the ground floor affected by the interference with its lights, "that abundant light remains for all ordinary purposes of inhabitation or business" he proceeds to point out what he means by that by observing that the room in the present state is "well lighted than the room in the present state is in many of the principal streets"; and accordingly he gives no relief to either tenant or reversioners. And it is especially noticeable, as to the reversioners, that he considers they have not suffered damage, and that to the extent of the house had been permanently affected in its

letting value; and even as to the tenant, we may observe that a very well lighted house is not being uselessly and unnecessarily better lighted than much light is being carried on there. The precise point arising in this case was clearly dealt with by Lord Justice Mellish in *Kelk v. Pearson*, where he says, "I cannot think that it is possible for the law to say that there is a critical quantity of light which a man is entitled to, and which is sufficient for him, and that the question is, whether he has been deprived of that quantity of light. It appears to me that it is utterly impossible to attach any rule or adopt any measure of that kind. It is essentially a question of comparison, whether by reason of deprivation of light the house is substantially less comfortable than it was before." This statement has been since approved, and it is not possible to believe it accurately states the existing law on the subject. So far as other Judges have in their judgments used expressions which appear to, or do in fact, conflict with what Lord Justice Mellish said, and which we understand, in our opinion, to be justified. And in particular we may say that the opposing views expressed by Vice-Chancellor Malins in *Laufmann v. Macdonald* (L.R. 4 Q.B. 421) and by Lord Justice Harbottle in *White v. Carter* (L.R. 18 Q.B. 180) cannot be regarded as sound. That being so, we think that in the present case the plaintiffs are entitled to relief. The case has been treated before us by both parties as one turning solely on the findings of Mr. Justice Wright, and we have no doubt that the interference with light, and substantial damage to the plaintiffs; and that being so, there should be judgment for them for the damages assessed. The defendant ought to pay the costs of the action, and of this appeal.

UNSUCCESSFUL ACTION AGAINST A CONTRACTOR.

—On Saturday, at Bromsgrove County-court, Joseph Phillips, crier, sought to obtain from Joseph Titt, builder, Birmingham-road, £40 damages for an accident which he said resulted from defendant's negligence. While walking on Worcester-street on the night of February 23, plaintiff experienced a heavy fall, breaking one of his ribs and bruising his arm, with the result that he was laid up for ten weeks. The case for the plaintiff was that the accident was caused by drainage trench which defendant had cut across the footpath. The Judge considered that the footpath was not in a dangerous state, and gave judgment for the defendant.

IN RE W. G. HOLMES, & CO. The first meeting of the creditors was held on Monday next, under order against William George Holmes, brewer, of 205, Vicarage-lane, West Ham. The debtor stated that in 1881 he commenced business with a capital of £5,000. In 1887, and in 1897, he purchased the premises, including the premises, the "Milkmaid" Hotel, Rider-street, St. James's, at a cost of £20,000, the greater part of which was raised on mortgage. He also formerly carried on a brewery at Kempton, Herts. He had no interest in the brewery and hotels. A statement of affairs was filed which showed gross liabilities £27,814 11s. 5d. of which £9,337 8s. 7d. was expected to rank and assets consisting of an estimated value of £67,000. The assets were valued in respect of securities held by creditors. The debtor did not submit any proposal to his creditors, but he was of opinion that the assets should produce sufficient to pay his debts in full. The creditors resolved that the debtor should be adjudicated a bankrupt, and appointed a chartered accountant trustee of the estate, with a committee of inspection.

THE STRAND TO HOLBORN IMPROVEMENTS.—At the Surveyors' Institution, Westminster, Mr. Robert Vigers sat as sole arbitrator on Monday last to decide between Messrs. 25, and 26, Little Wild-street, in the parish of St. Giles, which the London County Council have acquired under their Strand to Holborn improvement scheme. The claimants, the trustees of the will of the late George Smith, were represented by Messrs. H. A. Lyttelton, K.C., M.P., who said the surveyors valued the site at 15s. 6d. 2s. per square foot rental. At 2s. the land would produce a rent of £150 per annum. The surveyors valued the site at 10s. 6d. 2s. per square foot rental, and would produce £750 per annum. The expenses and adding the usual 10 per cent., the value worked out at £375. Evidence was given by Mr. A. Skingle, of Messrs. Farbrother, Ellis, and Co., Fleet-street, who was valuer for the Council, and Mr. John P. Smith, a surveyor to the Bedford Estate, who fixed the value at £314, Mr. Louis Giel, of Tower Hill, whose estimate was £3,438; and Mr. Henry Chapman, of Southampton-row, who valued the land at £4,400. On behalf of the claimants, Mr. H. Herbert Furber, surveyor, gave a valuation of £151 16s., and said he did not know of any dealings in land in the neighbourhood that would justify the figures of the claimants. Mr. H. A. Lyttelton, K.C., said that the value of the land, including £25 for old materials and Mr. Howard Martin, £1,132. The arbitrator reserved his decision.

The electric supply works at Bath are about to be extended at a cost of about £25,000.

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OBJECTIVE DESIGNS FOR THE QUEEN VICTORIA MEMORIAL— —SIR, CLXXIII, CLXXIII, AND CLXXIII. QUEEN'S —GATE—WESLEYAN CHAPEL AND SCHOOLS, BARFORD— —DINING ROOM FURNITURE—WHITBY ABBEY—FIMLEY COURT, SEBURY.	659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680
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Our Illustrations.

QUEEN VICTORIA MEMORIAL, BUCKINGHAM PALACE.

We have already illustrated the selected design for Mr. Aston Webb, A.R.A., and also those submitted by Mr. T. G. Jackson, R.A., and Sir Thomas Drew, P.R.H.A. To-day we publish drawings of Mr. Ernest George's design, and that by Dr. R. Rowand Anderson, R.S.A. The last-named in his report says that he avoided a "monade," feeling that the design was "not in accordance with Buckingham Palace," and that it would diminish the importance of the monument itself. He therefore adopted a balustrade, with larger pedestals at intervals for statues, and smaller intermediate ones for electric lamps. On each side of the Victoria monument a series of 16 semicircles, all of one size and plan, on which a fountain is shown. In Berlin the Sieges Allee is laid out, as Dr. Anderson's proposal adopted, in common with the other competitors, with a central avenue, and two side ones separated from the centre by lines of trees. The architectural treatment at Berlin consists of 16 semicircles, all of one size and plan, on the outer side of each of the two side avenues. White marble statues with somewhat monotonous effect are arranged on either hand in this way. Dr. Anderson's idea was to so place his statuary that it might resemble the general effect of a procession of figures passing to and from the palace, several features being located in the Clarence and Marlborough Gates. Alfred the Great being placed at Clarence Gate, and opposite Marlborough there was to have been a large semicircle, (here Elizabeth being in the midst surrounded by Burleigh and Shakespeare, Sir Philip Sidney, Sir Walter Raleigh, and the Duke of Edinburgh, and Drake. An Italian arch is located in this scheme at the corner of the Admiralty Buildings to form the Spring Gardens entrance to the Mall. The upper stage of this composition is designed to provide a place for a Royal equestrian statue. The special departure embodied in this design generally as compared with the others is that Dr. Anderson alters the Park to some extent round in front of the Horse Guards, where a composition devoted to the Duke of Marlborough and representatives of his time faces the Guards' parade. Mr. Ernest George, like Mr. Watson, stops the grand processional road at a point rather west of the Duke of York steps, and here he places an arched and elegant composition serving as a Royal entrance; it can hardly be termed a monumental archway. As compared with the elevation of the Duke of York's column and Carlton House Terrace, this part of Mr. George's proposal was not so much striking as it was more suited, as we remarked before, to a gentleman's park in the country. As such it has many admirable points

and no little artistic originality. Our illustration to-day gives a view of "The Queen's Garden" or forecourt inclosure, as designed by Mr. George, facing the palace. The eastern end of this "place" is bounded by a curved colonnade broken by domed pavilions, and in the middle of this elongated quad is placed the Queen's monument. Public carriage roads are seen flanking the composition, which is lengthened out by the addition of circular fountains east and west of the podium of the Memorial. Trees and statuary are introduced with a view of still further emphasising the general proportions of the composition, and of exaggerating its parallel lines, thus imparting the pinched effect from north to south which we mentioned in our previous notice. This is more evident in the side view looking north. That Mr. George's design is graceful and picturesque in its detail no one could deny, but as a whole, we think it may fairly be asserted that he has disappointed his admirers.

CLXXIII, CLXXIII, AND CLXXIII. QUEEN'S GATE, S.W.

This block of flats occupies a frontage of 62ft. to Queen's Gate at the Park end of the street, and occupies a gross land area of 7,688ft., the site having been the last piece of vacant land in Queen's Gate left on the estate of the Earl of Devon, Commissioners in 1851. As will be observed from the plan, there are two flats on each floor, the front portions of the basement being attached to the ground-floor flats, and by thus transferring the domestic accommodation to the basement larger reception-rooms and additional bedrooms are afforded to the ground floor. The five and a half upper floors have two self-contained flats each, and so arranged that any two flats can be thrown into one if required. The flats are served by electric lifts, and are electrically lighted, and, as a matter of course, have all the latest appointments. The exigencies of the plan involved the placing of the porch out of the centre, and this, to a certain extent, dictated the treatment of the elevation, which is carried out in red brick and white stone, and has been designed so as to harmonise with the adjoining and surrounding buildings. The building, which has just been completed, has been carried out by Mr. Henry Wood, of Westminster and London, from the designs of Mr. Delissa Joseph, F.R.I.B.A., of Basinghall-street, E.C. The adjacent house to the right was erected, we believe, from the designs of Mr. R. Norman Shaw, R.A., some few years ago.

BARFORD WESLEYAN CHURCH, SCHOOL, AND MANSE.

The plans for this building were submitted in an open competition for this scheme, and this design was adopted by the trustees. The church will accommodate 700, and the school 300. The entire cost will amount to about £7,000. The school block, already built at a cost of £1,250, was estimated by the architects at £1,250. The plan shows all the buildings. The church and manse are to be erected shortly—on the completion of the school. Messrs. Ford and Slater are the architects.

DINING HALL FURNITURE.

TWENTY-FIVE POUNDS was paid for this Early 17th century Oak Settle by the authorities at South Kensington, and for a genuine example of Old English carved work such as this the purchase was an undoubted bargain, even if the Jacobean style is not of the highest standard of artistic excellence, and that the elm panels are partly in modern carving. "William Sitwell" is inscribed on the upper part. The 15th-century Oak Credence was a greater bargain still at £3 4s. It is an excellent specimen of German or French Late Gothic Furniture in good preservation.

WHITBY ABBEY, YORKSHIRE.

Last week we gave plans and other drawings by Mr. Archibald A. Winterburn of this famous abbey church, and to-day we complete his studies so far as we have reproduced them, by giving a section and elevation of the east end of the choir, which is, of course, an exceedingly beautiful specimen of pure 13th century work.

FIMLEY COURT.

This house is about to be erected on a beautiful site in Surrey, overlooking a large lake in the grounds, and surrounded by pine trees. The grounds, and the entrance front. The other side, facing the lake, will have a terraced garden descending to the lake, with an ornamental landing-stage at the foot of a handsome flight of

steps arranged axially with the centre of the house. The materials are red brick and Cornish Down stone, with a red-tiled roof, the woodwork including the main cornice, being painted white. The architect is Mr. F. Steward Taylor, A.R.I.B.A.

CHIPS.

The new electric railway running from Milan to Varese, a distance of thirty-seven miles, has been opened to passenger traffic this week. At present the new railway enjoys the distinction of being the longest electric railway in the world.

A three-light stained-glass memorial window has been placed in St. George's Church, Barrow, and dedicated to the late Mrs. Phillips, wife of Archdeacon Phillips. The window represents the Saviour blessing little children.

Messrs. Lord and Hewlett, of New York, as the result of a competition for the purpose, have been selected to prepare plans for the new building for the Agricultural Department, Washington.

The demand for all classes of houses, but more particularly for cottage houses, continues in Cheshire-street in even greater force than before. This state of things is largely due to the fact that the new houses are so cheap. Every bit of land that can be secured for building ground is readily taken up, and as rapidly built upon.

St. John's Church, Gainsborough, is to be lengthened in the nave by three bays, with temporary side aisles, the cost being estimated at over £2,000.

A further section of the work involved in the complete restoration of the grand parish church of Kidderminster has been completed, and there was a special service on Oct. 21 for the dedication of the new oak roofs in the north and south aisles of the church. The successive restorations of the old church and the additions to it have covered a period of over half a century, and the expenditures they have entailed exceed £100,000. The work now completed has cost about £800, and it does not exhaust the matters requisite to be done in order to make the restoration complete.

A new parish-hall was opened at Paddock Wood last week. It seats 300 persons, and the builders were Messrs. J. Jarvis and Son, of Tunbridge Wells.

A new brass tablet has been erected in the north choir aisle of Lichfield Cathedral, the inscription on which states that the carved woodwork of the organ is dedicated in memory of the late Arthur Penketh, of Heywood-Lonsdale, of Lloverley and Shaving-ton.

The sub-committee appointed in connection with the proposed statue to Lord Byron in Aberdeen has met in the Town House, under the presidency of the Marquis of Huntly. In face of the fact that the subscriptions at present amount only to about £600, it was resolved to consult with Mr. Pittendrigh MacGillivray, A.R.S.A., the sculptor, with a view to a modification of the scheme.

The new technical schools at Barrow-in-Furness, which are being built by the town as a memento of the late Queen Victoria's Diamond Jubilee, are nearing completion.

The nurses' home, which has been erected at Salisbury in connection with the general infirmary at a cost of considerably over £7,000, as a local memento of Her late Majesty's Diamond Jubilee, was opened on Friday.

The corporation of Barleyham have decided to make application to the Local Government Board for permission to borrow £24,000 for the purpose of extending the gasworks, and £2,155 to erect a tunnel to purchase land in Newcastle-street to be used as a playground.

Faculties have been granted at York Consistory-court for a Queen Victoria memorial window at St. Mary's, Doncaster, by Ald. Athron; a memorial in Fulford Church to John R. Key, killed in South Africa; and for heating apparatus in Todwick Church.

The South-Eastern and Chatham Railway Companies have contracted to rebuild the Continental Pier at Queenborough at the cost of nearly £20,000.

The Bradford City Council have approved the promotion of a Bill in Parliament conferring various powers on the corporation. These include authority to purchase the Idle and Ecclehill gas companies' undertakings, to control billopsters' holdings, construct new tramways, and purchase land for reservoirs.

An inquiry has been held at Ilford, on behalf of the Local Government Board, into the application of the urban district council for sanction to borrow £10,000 under the Small Dwellings Act, and £2,000 for the widening and improvement of Sloop-lane, Chadwell.



- PANEL DETAIL.

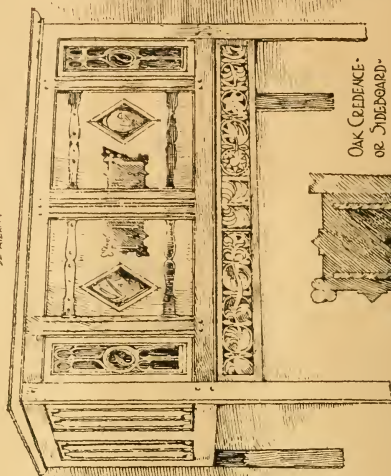


DETAIL A



- PANEL DETAIL.

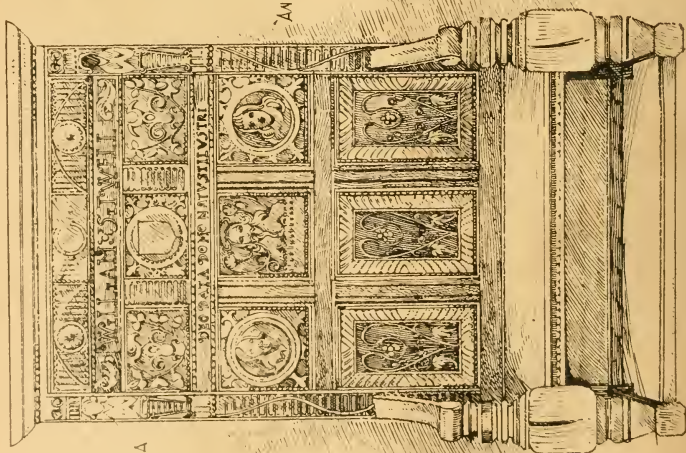
AN OAK SETTEE

DETAIL OF
TRACERY:-

DETAIL

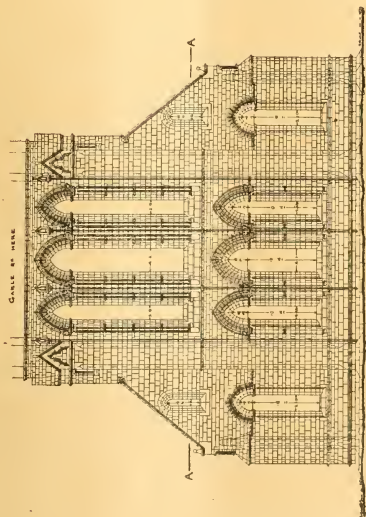
OAK CRESCENT-
OR SIDEBOARD-

DETAIL OF INCRUST

- DINING HALL FURNITURE - 15TH AND 17TH CENTY.

W. G. & A. J. B. of
 100 N. 4th St.
 St. Louis, Mo.

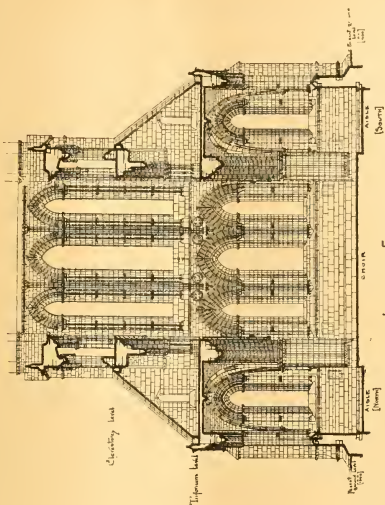
DESIGNED AND DRAWN BY ARCHIBALD A. WHITEHEAD.



EXTERIOR ELEVATION



PLAN OF LOWER WINDOWS



INTERIOR ELEVATION



PLAN OF UPPER WINDOWS

SCALE 1/4\"/>

1/4\"/>

Building Intelligence.

EDINBURGH.—The Rev. Dr. Mitchell, Moderator of the Church of Scotland, opened on Sunday the new church which has been built in George-road, Tynecastle, by the church, has a frontage of 66ft., and to secure better light for the portion of the interior darkened by the adjoining tenements, two entrances are provided, one near either extremity. The building is constructed with nave, 94ft. by 29ft., and aisles 61ft. long, the total width being 51ft. These divisions are situated in accordance with the church, but varied but the same projection finishing at the top with pinnacles and carved finials. One larger than the rest is completed as a balcony. Vestibules and gallery staircases are provided with the entrances, and below the circular arch which carries the east staircase is a pend, open to the passage leading to the hall behind the church. The style is Decorated Gothic. The gallery is lighted by a large window, 20ft. by 10ft., having the moulded mullions and elaborate tracery of the style. The space under the gallery has five moulded lancets. The interior has a ceiling boarded nearly to the ridge both in nave and aisles. It is heated by hot-water pipes carried under the floor, which is laid solid on a bed of asphaltic composition prepared by the Glasgow Speedwell Company, as security from dry or other rot. The plastered walls are tinted in primrose yellow, relieved by blue marginal lines and some stencilling in the apse. The church is seated for 1,000, including choir and elders' seats. A Communion table and chairs in oak, with decorative carvings, have been recently given to the church, which will cost under 4,000. Messrs. Hardy and Wight, of Edinburgh, are the architects.

LONDON COUNTY COUNCIL.—After a long discussion, the members of this body adopted on Tuesday the principle of providing shallow subways under streets for the reception of pipes and wires and for electric traction. It was resolved to apply for Parliamentary powers next session to construct such subways, and also for powers to construct a subway and an electric tramway therein from the Victoria Embankment, along Wellington-street, across the Strand, through the new street, thence to Holborn, and to take such tramway by an inclined plane to the street level in Southampton-row, the estimated cost being £282,000. It was further agreed to make an application next Session for power to construct an underground conduit system of electric traction for the County Council tramways at (Amberwell-green *via* Denmark-hill, Champion Park, Grove Vale, and Lordship-lane, to the Crystal Palace-road). The length of the new line will be 2½ miles, and the cost of construction £108,650. The street widenings required will cost £114,950. It was also decided to reconstruct Bow Bridge at a cost of £1,200, to be partly borne by the West Ham Corporation and the Council, and to provide a new and more adequate fire-brigade station for Brixton than the existing one in Fernside-road. The tenders of Messrs. Dick, Kerr, and Co., Ltd., were accepted for the contract A for £25,954, the continuous-current plant, and B for £46,629 of the three-phase plant required for the electricity generating stations to be erected at Greenwich, at the temporary station to be established near Loughborough Junction, and at sub-stations in connection with the reconstruction for electrical traction of the London County Council tramways between (a) three steps at the Victoria, and (b) Blackfriars-road and Kennington, and (c) Waterloo-road and St. George's Circus. Messrs. Dick, Kerr, and Co., Ltd., will be allowed to sublet 1 to the English Electric Manufacturing Co., Ltd., of Preston, the manufacture of the dynamos, generators, and other electric plant under both contracts; (2) to Messrs. Ferranti, Ltd., the manufacture of the machinery under both contracts; and (3) to Messrs. Belliss and Moreau, Ltd., the manufacture of the auxiliary engines under the contract A for the continuous-current plant.

MUSSELBURGH.—At a meeting of Musselburgh Town Council, held on Tuesday, Provost Whitehead reminded his colleagues that the acceptance of estimates for the reconstruction of the municipal buildings had been held over till after the election, and now, after such a distinct pronouncement had been made by the ratepayers of the town, he moved that no estimates be accepted,

and that no action be taken in regard to the reconstruction of the municipal buildings in the mean time. He deplored the necessity to make such a motion, but they must bow to the will of the ratepayers. This was unanimously agreed to; all previous resolutions were formally rescinded; and the clerk instructed to get in all accounts incurred in connection with plans, &c., so that the matter could be settled at once.

WALWORTH, S.E.—A memorial chapel has been added to St. Peter's Church, Walworth-road, S.E., in connection with the south aisle, from the designs of Mr. J. H. M. Morris, of St. Albans, F.R.I.B.A., and dedicated last week to the Rev. Canon Brooks, of Kennington. Its cost was undertaken by the family of the rector, the Rev. J. W. Horsley, and it was carried out by Messrs. Wake and Dean, of Southwark. An arched screen divides off the chapel from the church, and a winged reredos incloses the altar, which bears a polished Hopton Wood stone slab inscribed with the above inscription. The table is finished in "Velure" enamel white, and in its central compartment for the frontal has a painting of St. Mary the Virgin. The seats, stained a bronze-green, correspond with those throughout the church, and the work generally harmonises with the other fittings and chancel inclosure. The new fittings were made four years ago, from the designs of the same architect, when the old square pen pewing, put in by Sir John Soane, the original architect of the church, was removed. The organ has been removed from the western gallery and placed in the choir, and a wrought-iron domed cover to the marble font has been executed by Messrs. Benham and Freude. It is decorated with four burning candles, which are lighted at baptisms.

CHIPS.

The Bishop of Winchester conducted a service on Wednesday in the chapel at the Holloway Sanatorium, Virginia Water, after its restoration and redecoration at a cost of several thousand pounds. There are also a new organ and altar, with several stained-glass windows.

In connection with the projected new electric railway from Westminster to Brighton, for which Parliamentary powers are to be sought next session, it is interesting to learn that the London, Brighton, and South Coast Railway Company have reduced the services of Major Cardew and Mr. Philip Dawson as consulting electrical engineers to advise generally on the subject of electric traction and in connection with electric works on their own line.

At St. Saviour's Collegiate Church, Southwark, on Wednesday, the Bishop of Southwark unveiled and dedicated the Cruden memorial window—a memorial to the author of the celebrated concordance of the Bible, who lies buried in the parish. The portrait of Cruden appears in the medallion at the top of the window, which is in the north wall of the church, and was designed by Mr. C. E. Kempe.

At Hornsea, on Sunday week, there was dedicated a stained-glass window (the west window of the parish church) in memory of the late Canon Colson.

A memorial brass in the style of the Late Decorated period has been erected in Long Crenon Church, in the village of Long Crenon, near Epsom, five unequal panels. The inscription, which is in Old English, is introduced by the priest's insignia (a chalice and host) and commemorates the vicarage of the Rev. F. E. Ogden, who died in 1900, at whom the church and the memorial space is surrounded with a massive curl, on which texts are engraved, the whole being executed in Campanella marble. This work was executed by Messrs. Hart, Son, and Perndl. On the same day an imposing monument was erected to Mr. Ogden's memory, consisting of a Latin cross, mounted on three steps. The base of the monument is surrounded with a massive curl, on which texts are engraved, the whole being executed in Campanella marble. This work was executed by Messrs. Farmer and Brindley.

The President of the Wesleyan Conference (the Rev. Dr. P. H. Murray) opened at Millwall on Monday a new Gothic church, the Wesleyan of the town have erected. In addition there are a school and other buildings. The entire outlay is £9,080.

Some of the Master Painters' Associations of the United States are calling the attention of city councils and local boards of health to the necessity for a restriction on forbidding the use of wall-paper without previously removing the old paper from the wall. Many cases of infectious and other diseases are said to be traceable to the practice of covering up old wall-paper with new.

Out of ninety-four candidates, Mr. J. C. Wakeford, of Blackburn, has been appointed surveyor of the Bolton Urban District Council.

With reference to our notice of the new technical institute, Fallowham, we should have mentioned that the hours in connection with this building have been laid with Mr. Roger L. Lowe's patent redwood wood-block flooring.

Princess Christian, on Wednesday, visited Leatherhead for the purpose of laying the foundation-stone of the new buildings for the School for the Indigent Blind. The new buildings, which will occupy 15 acres in extent, will be completed in June, 1902, and as soon as possible after that date the chapel, sanatorium, gymnasium, and laundry will be ready for use.

The annual report of Mr. J. Burnett, chief labour correspondent of the Board of Trade, on trade unions in the United Kingdom in 1900, is issued. It states that during the year the membership of all trade unions rose from 1,800,869 to 1,905,116.

The Munich Academy of Fine Arts has elected as honorary members Mr. Edwin Abbey, Mr. John Sargent, Mr. Walter Crane, and Mr. Swan, the sculptor.

A meeting of the St. Albans and Herts Architectural and Archaeological Society was held at the County Museum, St. Albans, Friday. Mr. Fox Bourne presided. Mr. A. Whitford Anderson, A.R.I.B.A., of Watford, read a paper on "The Lesser Domestic Architecture of Hertfordshire."

The laying of the foundation-stone of St. Aldhelm's Church, Silver-street, Edmonton, was performed by the Lord Bishop of Islington on Saturday afternoon. The cost will be about £7,000.

The magistrates for Edinburgh unanimously granted a theatrical licence on Monday for the Tivoli Theatre in St. Stephen's-street, built from plans by Mr. Marriac, architect, of 7, York-place, Edinburgh. The burgess engineer reported that the building had been fitted up in accordance with a plan sanctioned by the Dean of Guild Court. The pit was seated for 1,170 people, the boxes and galleries for 420, and the gallery for 380—in all, 1,970 people. There were four exits. Inside doors all opened outwards, the building was lighted throughout with electricity, the lavatory accommodation was ample, and, in his opinion, the building was fitted up for the purpose for which it was intended. The report of the firemaster stated that he considered the gangways and exit doors to be ample for the building.

A new Board school has just been opened at Salford, Birmingham. It provides accommodation for 10 classes, and has a cost of £18,468. Mr. E. Merton Hughes was the builder.

Mr. R. H. Bicknell, M.Inst.C.E., Local Government Board inspector, held an inquiry at the council chamber, Jarroo-on-Tyne, on the 6th inst., regarding an application of the corporation for sanction to borrow £4,084 for works of private improvement.

Mr. W. C. Blackridge, assistant surveyor and inspector to the Ashbourne Rural District Council, has been appointed, out of 72 applicants, to the post of surveyor and inspector to the Isle of Axholme Rural District Council, at a salary of £140 per annum.

An inquiry has been held, on behalf of the Local Government Board at Nottingham, into the application of the city council for sanction to borrow £21,000 for the erection of a refuse destructor at the Eastcroft depot, London-road.

The municipal registrar of Hoxton has received an election through the generosity of Mr. H. Matthews for outgoing mayor. The gift takes the form of a new mace, designed by Mr. William Ward, the borough surveyor, and is 2ft. 6in. high, its orb being 3in. in diameter. It is made of ebony, mounted on silver, and the rest has been constructed by Messrs. Harry Hems and Sons, of Exeter.

The Government inspection of the Islington extension of the City and South London Railway took place on Wednesday, and the line will be open for public traffic on Sunday next.

In the case of the application made for an order of disqualification against Mr. W. H. B. Broadstairs and Faversham, Kent, builder and contractor and brick manufacturer, the discharge has been suspended for four years ending Oct. 7, 1905.

Some time ago the directors of the North-Eastern Railway Company recently decided to double their main line in the county of Durham. The new line, which is being built by the company, will run along the old line, having for its object the running of the goods and passenger trains of different lines. Messrs. T. D. Ridley and Sons, Middlesbrough, have secured the contract for the work, which also involves the reconditioning of the station at Birtley, Launcey, and Low Fell. The extensions will necessitate the demolition of the large Station Hotel at Birtley, which will be replaced by a building on the opposite side of the railway. The work of levelling has already commenced.

A SPECIAL committee of the London Chamber of Commerce have reported against the proposed new by-laws recently issued by the London County Council for consideration by the Metropolitan borough councils, relative to "the regulation of lamps, signs, and other structures overhanging the public way, not being within the City," as being likely to injuriously affect the traders in the industries concerned. The by-laws, although issued by the County Council, under section 164 of the London Building Act, 1894,

which were finally approved and confirmed by the Local Government Board, be administered by the borough councils. The committee point out that the suggested by-laws are innovation, and if applied retrospectively without amendment will cause immediate inconvenience and expense to many traders. The committee submit certain proposals for amendment to be considered, and assert that "it modified in the manner indicated the by-laws will enable the authorities to exercise all necessary control for the protection and well-being of the public, without unduly curtailing the liberty of traders in the free prosecution of their business."

MEETINGS FOR THE ENSUING WEEK.

MONDAY—Royal Institute of British Architects, 11.30 p.m., Mr. R. Arning Bell, 8 p.m.

TUESDAY—Institution of Civil Engineers, Discussion on "The Discharge of Sewage into a Tidal Estuary," 8 p.m.

WEDNESDAY—Institution of Builders, "Submarine Construction and Tunneling by Compressed Air," by Woodman Hill, 7.30 p.m.

THURSDAY—Society of Art, Opening Address by the Chairman of Council, Sir W. H. Preece, K.C.B., F.R.S., 8 p.m.

FRIDAY—Architectural Association, Discussion Section, Glasgow Architectural Craftsmen's Society, "Foreign Competition in the Building Trades," by Geo. Merrettson, p.m.

CHIPS.

In the King's Bench Division on Thursday in last week, Mr. Charles Thomas Johnson, builder, of Whetstone, N., recovered £120 damages from the London Road Car Company, for personal injuries sustained owing to the negligence of a driver in the defendant's service. Plaintiff was driving a pony and trap in the defendant's road when an omnibus belonging to the defendant company ran into the trap. Plaintiff was thrown out, and sustained slight concussion of the brain and severe bruises.

The organ in St. Paul's Church, Chacewater, having been renovated and added to by Messrs. Hall and Sons, of Plymouth, as a memorial, was reopened on Sunday.

The corporation of Ipswich have just taken over the management of the local tramways from a private company, and will, under the provisions of an Act obtained last session, convert them for the employment of electric traction instead of the horse-power at present employed.

Mr. Carnegie proposes to give £100,000 for the building, endowment, and equipment of a technical college for the South of Scotland, to be erected in one of the Border towns, preferably Galashiels.

The foundation-stone of new head offices for the Norwich Union Life Insurance Society was laid in Surrey-street, Norwich, last week. The new building will be Classic in character and well proportioned, and will be erected from designs by Messrs. G. J. and F. W. Skipple, of Norwich, selected some time since in competition.

The ex-mayor of Southampton, Alderman George A. E. Hussey, on whom a Knighthood has been conferred, is a workman builder in business in that borough, and has filled the chair for three years in succession.

Mr. Alfred Waterhouse, R.A., having been compelled to resign the chairmanship of the Art Standing Committee of the Royal Institute of British Architects, owing to his much-regretted illness, Mr. J. MacVicar Anderson has been unanimously elected to succeed him at a meeting of the committee.

The formal opening of Wesley-street Board Schools, Farsley, Leeds, took place on Friday. A mixed school has been built, giving accommodation for 180 scholars, which can be increased to 400, if required, at a very small cost. The cost has been £7,215.

On Thursday in last week the new electric light will return destructor works at Rhyll, which have been constructed at a cost of £30,000, were opened. The electric dynamo has an output of 160 kilowatts at a speed of 360 revolutions per minute. In all, some 15 miles of cables have been laid. The lamps and consumers connected represent about 2,000 50-watt lamps. There are also 55 12-ampere 16-hour arc-lamps, 36 of them being along the promenade.

Mr. J. C. Wakeford, of Blackburn, has been appointed surveyor to the urban district council of Bolton from among 91 candidates.

A marble slab to the late Lord Russell of Killowen, executed by Mr. J. W. Symington, has been placed in the Old Hall, Lincoln's Inn.

The will of the late Mr. Henry Chambers, of the Manor, Sydenham Hill, and the Abbey Brickfields, Eversham, has been proved, the value of the personal estate being £107,214 7s. 10d. and of the 4½% of the estate £110,251 5s. 6d.

Trade News.

WAGES MOVEMENTS.

IRON.—The slaters, who have been out on strike since August 19, returned to work on Friday morning. The men have not the support or assistance of their own society, and all through they have been fought by union men sent down from various places to take up the work the Hull men refused. On the date named, the Hull men struck against a code of rules which had been put forward by their employers, they thinking the Hull employers could, if they chose, employ labourers to prepare the slates for laying upon the roofs. The masters explained to the men that this had never been done in Hull, although it had been done in other parts of Yorkshire, and they had no intention of departing from the custom that had so long prevailed in the city, the slaters doing all the work of preparation. The operatives have now returned on the understanding that they will work amicably with the imported men.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.	Per ton.
Rolled-Iron Joists, Belgian	£3 0 0	to	£3 10 0
Rolled-Steel Joists, English	6 10 0	to	6 15 0
Wrought-Iron Girder Plates	7 10 0	to	7 15 0
Bar-Iron, good Stuffs	6 15 0	to	8 10 0
Do, Lowmoin, Flat, Round, or Square	20 0 0	to	20 0 0
Do, Welsh	5 15 0	to	5 17 0
Under Plates, Iron	25 10 0	to	25 10 0
South Staff	10 0 0	to	10 0 0
Best Sudebille	12 0 0	to	12 0 0
Angle 10s., Tee 20s., and 30s.	12 0 0	to	12 0 0
Builders' Hoop-Iron, for banding, &c., 25 lbs.	10 0 0	to	10 0 0
Builders' Hoop-Iron, galvanised, £15 10s. 6d. per ton. ..	15 10s. 6d.	to	15 10s. 6d.
Galvanised Corrugated Sheet-Iron	10 18s. 2d.	to	10 22s. 6d.

Off. to 8ft. long, inclusive	10 10s.	to	10 10s.
Gauge	£11 5 0	to	£12 6 0
Best ditto	11 15 0	to	11 12 6

	Per ton.	Per ton.	Per ton.
Cast-Iron Columns	£10 0 0	to	£10 0 0
Cast-Iron Stanchions	6 10 0	to	6 10 0
Rolled-Iron Fencing Wire	8 0 0	to	8 5 0
Rolled-Steel Fencing Wire	6 10 0	to	6 10 0
Do, Galvanised	8 0 0	to	8 5 0
Cast-Iron Sash Weights	4 10 0	to	4 15 0
Cut Clasp Nails, Size to 6in.	5 0 0	to	5 10 0
Cast-Iron Brads	9 10 0	to	9 10 0

Wire Nails (Points de Paris).—										
0 to 7	8	9	10	11	12	13	14	15	B.W.G.	
2.2	2.2	2.2	2.2	1.2	1.2	1.2	1.2	1.2	1.2	per cwt.

Cast-Iron Scott Pipes	£10 0 0	to	£10 0 0
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3in. diameter	£5 15 0	to	£5 10 0
4in. to 6in.	5 12 8	to	5 17 6
7in. to 24in. all sizes	5 0 0	to	5 5 0
(Cast with composition, 5s. 0d. per ton extra; turned and bored joints, 3s. 0d. per ton extra.) ..	5 0 0	to	5 5 0

and bored joints, 5s. 0d. per ton extra.]	
Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 112s. 6d.
Hot Blast, ditto	65s. 0d. to 70s. 0d.

Wrought-Iron Tubes and Fittings—Discount of Standard List's f.o.b. :—	701 p.c.	to	701 p.c.
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Gas-Tubes	701 p.c.	to	701 p.c.
Water-Tubes	65	to	65
Steam-Tubes	65	to	65
Galvanised Gas-Tubes	57 1/2	to	57 1/2
Galvanised Water-Tubes	47 1/2	to	47 1/2
Galvanised Steam-Tubes	47 1/2	to	47 1/2

	Per. ton.	Per. ton.	Per. ton.
Zinc, English (London mill)	£21 13 0	to	£22 15 0

Do, Vieille Montagne	23 0 0	to	23 10 0
Sheet Lead, 36 lb. per sq. ft. super. 12 1/2 ..	12 1/2	to	12 1/2

Pig Lead, all test, p.c.s.	12 0 0	to	12 5 0
Lead Sheet, in 26 lb. bags	15 2 6	to	15 5 0
Copper Sheet, sheeting and rods	80 0 0	to	80 0 0

Copper, British Cast and Ingots	115 0 0	to	115 0 0
Tin, Straits	115 0 0	to	115 0 0
English Ingots	115 0 0	to	115 0 0
Spelter, Belgian	17 0 0	to	17 0 0

TIMBER.

	per load £10 0 0	to	£17 0 0
Beech, Burnham	10 0 0	to	15 10 0
" Bangkok	4 2 6	to	4 13 0

Quebec Pine, yellow	4 2 6	to	4 13 0
" Birch	3 12 0	to	3 13 0
" Elm	5 3 0	to	5 6 0
" Ash	5 3 0	to	5 6 0
Danter and Memoel Oak	2 10 0	to	2 10 0
Fir	2 0 0	to	3 17 6

Waxed, Kiln p. log	2 5 0	to	3 17 6
Lath, Danish, p.f.	4 0 0	to	4 0 0
St. Petersburg	7 15 0	to	7 15 0
Bux	7 0 0	to	7 0 0

Squash, U.S.A., per cubic foot	0 1 9	to	0 2 0
Mahogany, Cuba, per super foot	0 0 6	to	0 0 8
" do,	0 0 6	to	0 0 7

" Honduras	0 0 4	to	0 0 4
" Mexican	0 0 9	to	0 0 9
" African	0 0 8	to	0 0 9
Cedar, Cuba	0 0 3	to	0 0 3
" Honduras	0 0 3	to	0 0 3
Sittoung	0 0 10	to	0 0 10
Walnut, Italian	0 0 8	to	0 0 7
" American logs	0 2 8	to	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1 1/2 in. by 1 1/2 in.	£22 0 0	to	£22 5 0
Quebec, Pine, 1st	13 0 0	to	13 5 0
" 2nd	11 0 0	to	11 5 0
" 3rd	12 0 0	to	12 5 0
Canada Spruce, 1st	7 1 0	to	7 1 0
" 2nd and 3rd	7 1 0	to	7 1 0
New Brunswick	7 1 0	to	7 1 0
" 2nd	7 1 0	to	7 1 0
St. Petersburg	7 1 0	to	7 1 0
Swedish	11 5 0	to	11 10 0
Finnish	11 5 0	to	11 10 0
White Sea	11 5 0	to	11 10 0
Hattens, all sorts	6 5 0	to	14 5 0
Floor-boards, per square of 1in.	0 11 0	to	0 18 0
2nd ditto	0 12 0	to	0 14 0
" 3rd	0 6 0	to	0 12 0
Staves, per standard M	£37 10 0	to	£45 0 0
U.S. pipe	225 0 0	to	250 0 0
Memoel, cr. pipe	180 0 0	to	200 0 0
Memoel, brack	180 0 0	to	200 0 0

STONE.

Darley Dale, in blocks	per foot cube	£3 2 1/2
Red Mansfield ditto	per foot cube	£3 2 1/2
Hard York ditto	per foot cube	£3 2 1/2

Ditto ditto ditto saw both sides	per foot sup.	0 2 8
" random sizes	per foot sup.	0 2 8
" 1/2 in. slabs sawn two sides	per foot sup.	0 1 5
" 1/2 in. slabs sawn one side	per foot sup.	0 1 5
" 1/2 in. slabs sawn both sides	per foot sup.	0 2 8
" 1/2 in. slabs sawn one side	per foot sup.	0 1 5
" 1/2 in. slabs sawn both sides	per foot cube	0 2 0
" 1/2 in. slabs sawn one side	per foot cube	0 2 1/2

OILS.

Lined	per tun	£33 5 0	to	£33 10 0
Unlined	per tun	£33 5 0	to	£33 10 0
Rape	per tun	£33 5 0	to	£33 10 0
Olive, Spanish	per tun	£33 5 0	to	£33 10 0
Seal, pale	per tun	£33 5 0	to	£33 10 0
Castor, American	per tun	£33 5 0	to	£33 10 0
Do, Cayenne	per tun	£33 5 0	to	£33 10 0
Palm, Lagos	per tun	£33 5 0	to	£33 10 0
Do, Java	per tun	£33 5 0	to	£33 10 0
Lubricating U.S.	per gal.	0 7 0	to	0 8 0
Petroleum, refined	per gal.	0 0 5 1/2	to	0 0 5 1/2
Turbentine, American	per barrel	0 19 8	to	0 19 8
Do, refined	per barrel	0 19 8	to	0 19 8
Turbentine, American	per tun	£37 0 0	to	£37 5 0

All F.O.R. London.

To Manufacturers and Others.—A LITERARY and scientific work, "The Building Trade," offers its assistance in an adequate form in the preparation of a circular for the building trade, and in the building of a circular in these days of little needed, but the same information is given in a form of a circular, and its publication on some terms of sale is recommended. The work is published by the London and Westminster Press, Ltd., 10, Abchurch Lane, London, E.C. 4.

The urban district council of Edmonton have received a letter from the Local Government Board sanctioning loans as follows:—£17,385 for public baths, £5,000 for public offices, £1,012 for mortuary, £2,000 for post-mortem room, and £2,800 for a depot.

Mr. W. Gilbee Scott is the architect, and the tender of Mr. Lawrence has been accepted for the work.

The new municipal buildings at Roigate were opened by Viscount Middleton on Thursday in last week.

The Dover Corporation on Monday decided to apply to the Local Government Board for power to include within the borough boundaries over 7,000 acres of land, comprising the neighbouring village of River, Ewell, Alkham, and the rapidly-rising rest of St. Margaret's.

On Friday morning a disastrous fire broke out at Westgate Works, Weymouth, Woodrich, S.E., upon the property of Messrs. Kirk and Rudall, builders and contractors. The whole set of premises sustained very serious damage before the fire was overcame.

Mr. William Outlaw, builder, of Diss, has been adjudged at the age of 70 years to be a fit and proper person to be a builder and carpenter on the Broad and Oakley Estates, under the late Sir Edward Kerrison.

The town of Romford, which is at present with a recreation-ground or open space of any kind, is presented by Mr. H. H. Kipling with a plan of the town, and the ground and the hills as a park. The gift comprises about fourteen acres of land and six acres of water.

A new parish-hall in connection with St. Augustine's Church, North Shields, was formally opened on Monday. The hall has been erected by Mr. J. Condon, of North Shields, from the designs of Messrs. Hope and Maxwell, of Newcastle. The cost, including the site, amounted to £1,513 12s.

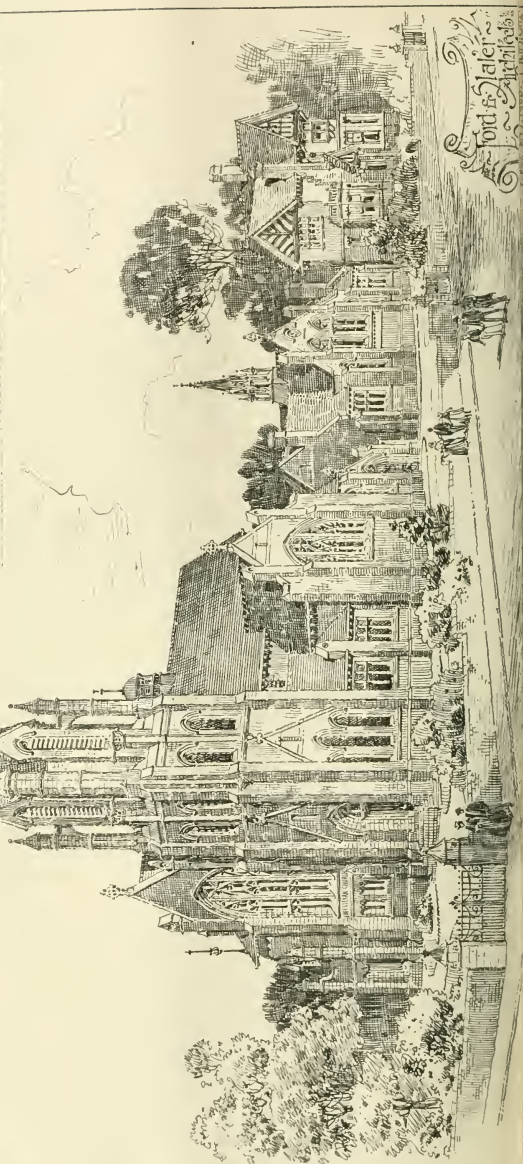
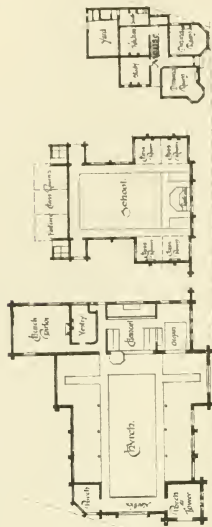
A large new gasometer, which has been for months in course of erection at Walker, for the Newcastle and Gateshead Gas Company, is nearly completed, and will soon undergo the final tests before being brought into use. This gasometer is the largest in the North of England, and intended to hold between five and six million cubic feet of gas.

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London—Fire Escape Stairs, &c., Workhouse	Guardians	G. F. Ashton, Clerk, 71, High-street, Runcorn	Nov. 16
Leeds—Four Houses, Lidditt Park	Guardians	M. W. Lawton, Architect, 86, Albion-street, Leeds	16
London—Shedding Ceiling of Workhouse Chapel	Guardians	A. Hayes, Clerk, Workhouse, London	16
Ardaye—Additions to Farm Offices	Metropolitan Asylums Board	Davidson and Gardner, 21, High-street, Aberdeen	16
London, W.—Repairs at Nos. 203-205, Harrow-road	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Embankment, E.C.	16
South Littleborough—Alterations to Farm Offices	Corporation	Davidson and Gardner, 21, Dec-street, Aberdeen	16
Rotherham—Road Bridge at Market Hall	Corporation	E. Platt, Architect, 10, High-street, Rotherham	16
Middleburgh—Brick Addition to Smallpox Hospital	Sanatorium Committee	The Borough Engineer's Office, Middleburgh	16
Canterbury—Monastic Dwellings and Schools	Town Council	The Right Reverend Monsignor Smollen, P.P., Vt. O., Ennisville	16
Droghda—Electric Substation, Addiscombe-grove	Town Council	Edgewood Electric Office, Factory-lane, Croydon	16
Ramsay, Hunts—Additions to Forty-Forty Schools	School Board	J. G. Staley-Brown, F.R.A.S., North-street, Peterborough	16
Burham—Printing Works, Sadler-street	Town Council	H. T. Gradon, Architect, Market-place, Durham	16
Hayle—School and Additions to Wesleyan Chapel	Town Council	Sampson Hill, Architects, 10, Market-street, Exeter	16
Leeds—Engine-House, &c.	Watch Committee	F. Robinson, Architect, 72, Albion-street, Leeds	16
Arley, Leeds—Alterations to Workhouse Hospital, Hill Top	Bransley Union Council	Beckwith and Webster, Architects, 2, Basinghall-gate, Leeds	16
Leeds—Engine-House	Rural District Council	E. Butcher, Designer, 10, Market-street, Leeds	16
Littleborough—Central Board School	School Board	Butterworth and Duncan, Architects, South-parade, Rochdale	16
London-under-Lyne—Extension of Mechanics' Shop	Workmen's Building Co.	George and Son, Architects, Old-square, Ashton-under-Lyne	16
Middleburgh—Mansion, Albert Park	Watch Committee	E. Mitchell Butcher, Architects, 20, Market-street, Middleburgh	16
Pontefract—Sixty Houses	Parish Council	T. Rodrick, Architect, Clifton-street, Aberdare	16
Leamington—Extension of Mill-lane Infectious Diseases Hospital	Electricity Committee	W. H. Travers, Engineer, Public Offices, Egrement, Cheshire	16
Leamington—Leamington House	Electricity Committee	W. Loock, M.L.C., Municipal Office, Leamington	16
Stockport—Workhouse Bakery	Guardians	J. Hunt and Son, Architects, 4, Warren-street, Stockport	16
Leeds—Engine-House, &c.	Watch Committee	Percy Robinson, Architect, 72, Albion-street, Leeds	16
Leeds—Central Board of Five Shops	Parish Council	The Secretary, Leeds City Council, Leamly	16
Govan—Children's Blocks, Merryfatts Poochouse	Electricity Committee	J. Barclay, Architect, 245, St. Vincent-street, Glasgow	16
Manchester—Engine and Boiler House, Sturt-street	Electricity Committee	E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester	16
Leamington—Alterations to School Road at Witton Outlet Works	Electricity Committee	William Stiles, Architect, 10, Market-street, Leamington	16
Hornslow—Twenty-two Houses for Working-class	Leamington and Leamworth U.D.C.	P. F. Parkman, A.S.E., Surveyor, Town Hall, Hornslow	16
Levenshulme—Electricity Substation	Manchester Corporation	The City Surveyor, Town Hall, Levenshulme	16
Chatteris—New Workman's Inn	Leamington and Leamworth U.D.C.	W. H. D. Horsfall, Architect, Lower Church-lane, Halifax	16
Bilton—Machinery Shed	Leamington and Leamworth U.D.C.	The Engineer's Office, Hunt's Bank, Manchester	16
Lancaster—Water-Tower, Marton-street	Electricity Committee	T. Cann Hughes, Town Clerk, Town Hall, Lancaster	16
Leamington—Front House	School Board	H. Friedberg, Architect, 10, Gortington, Mannington, Bradford	16
Blyth—Alterations to Graft School	Manchester Corporation	Landow and Gage, Architects, Metro. Bank Chambers, Newport, Mon.	16
Darlington—Electricity Substation	Manchester Corporation	The City Surveyor, Town Hall, Manchester	16
Balfax—Golden Lion Hotel, High-road Wall	H.M. Commissioners of Works	Lister Goads, A.R.B.A., 10, Works, Storey's Gate, S.W.	16
Darlington—Enlargement of Head Post Office	E. Layton	A. H. Steele, Architect, 1, Effingham Lane, Dover	16
Canterbury—Three Cottages, Martyrs' Field-road	Leeds Industrial Co-op. Society	John W. Tawett, Secretary, 10, Market-street, Leeds	16
Leeds—Central Board of Five Shops	Chiswick Iron Works, Ltd.	Richard Housfield, Clerk, Chiswick	16
Leamington—Leamington House	U.D.C. Committee	E. Froisher, A.M.I.C.E., Surveyor, Town Hall, Fleetwood	16
New Kensington—New Wing to Debarth House	H.M. Commissioners of Works	E. Peters Morris, Architect, 10, Market-street, Leamington	16
Crookston—School	Lancaster School Board	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	16
Hendon—Electric Substation	Manchester Corporation	J. Constable, Architect, 3, Hill-street, Edinburgh	16
Lancaster—Carshed (100ft. by 45ft.)	Manchester Corporation	The City Surveyor, Town Hall, Heston, North	16
Halworth—Rebuilding Ryburnside Paper Mills	Tramway Committee	The City Surveyor, Town Hall, Lancaster	16
Leamington—Leamington House	Tramway Committee	Richard Horsfall and Son, Architects, Commercial-street, Halifax	16
Redhill—Business Premises, High-street	Wallasey Urban District Council	H. T. Crowther, Engineer, Great Eastern, near Birkenhead	16
Weymouth, Weymouth—Additions to Hospital	Market Hall Co., Ltd.	Clayton and Black, Architects, Brighton	16
Leamington—Leamington House	Langmuir School Board	Nedley Hall, M.S.A., 29, Northgate, Halifax	16
Newbridge—House, &c.	Langmuir School Board	W. Watkin Williams, Architect, 63, Wind-street, Swansea	16
Walsley—Wern School (840 places)	Langmuir School Board	W. H. Johns, Architect, 10, Wind-street, Swansea	16
Leamington—Leamington House	Langmuir School Board	W. Watkin Williams, Architect, 63, Wind-street, Swansea	16
Leamington—Leamington House	Langmuir School Board	Alexander Cullen, Architect, Branch Chambers, Swansea	16
Leamington—Leamington House	Langmuir School Board	A. Lewis, Architect, 21, West-gate-st., Glasgow	16
Leamington—Leamington House	Langmuir School Board	Charles E. Butcher, Architect, 3, Queen-street, Colchester	16
Leamington—Leamington House	Langmuir School Board	William Bakewell, F.R.I.B.A., 38, Park-square, Leeds	16
Leamington—Leamington House	Langmuir School Board	J. Cowley, 10, Market-street, Leamington	16
Leamington—Leamington House	Langmuir School Board	John J. Jarvis, Secretary, Gas Offices, Queen-street, Swindon	16
Leamington—Leamington House	Langmuir School Board	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	16
Leamington—Leamington House	Langmuir School Board	H. B. Burt, Architect, 30, Leamington-street, Manchester	16
Leamington—Leamington House	Langmuir School Board	The County Surveyor, Oxford	16
Leamington—Leamington House	Langmuir School Board	Cressey and Keighley, Architects, Morecambe	16
Leamington—Leamington House	Langmuir School Board	Leeds City Council, 10, Market-street, Leeds	16
Leamington—Leamington House	Langmuir School Board	Habershon, Pawker, & Groves, Architects, High-street, Newport	16
Leamington—Leamington House	Langmuir School Board	John G. Morley, Borough Engineer, West-lane, Glasgow	16
Leamington—Leamington House	Langmuir School Board	Thompson and Simpson, Architects, 241, West-gate-st., Glasgow	16
Leamington—Leamington House	Langmuir School Board	W. Thurnall, Clerk, Brook-street, Kennington-road, S.E.	16
Leamington—Leamington House	Langmuir School Board	Chas. F. Wake, C.E., City Surveyor, Town Hall, Glasgow	16
Leamington—Leamington House	Langmuir School Board	W. C. Haytney, 9, Queen-street-place, E.C.	16
Leamington—Leamington House	Langmuir School Board	F. P. Tress, Architect, 8, Jurg-street, Weymouth	16
Leamington—Leamington House	Langmuir School Board	J. H. Norton, Architect, 10, M. A. St., St. John's, South Shields	1



BASFORD WESLEYAN CHAPEL AND SCHOOLS.



Food & Water
Supply

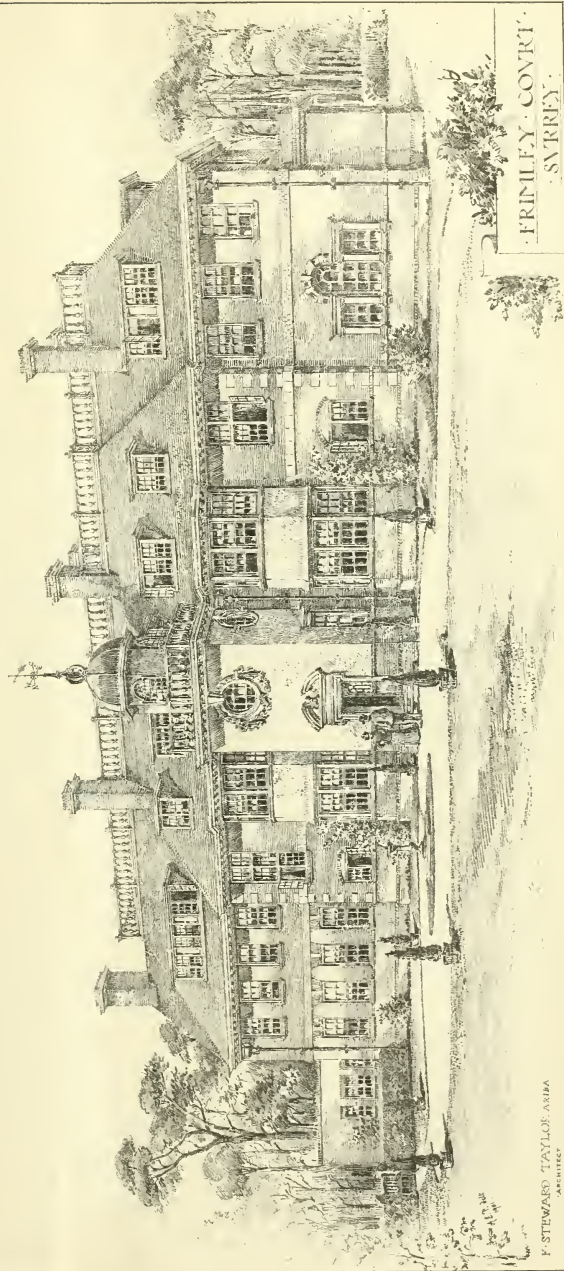


Ground Floor Plan

Scale of Feet 0 10 20 30 40



First Floor Plan



F. STEWARD TAYLOR, ARCHT.

FRIMLEY COURT
SURREY

"Pencil-Work" by James Knowles & Co. Queen Square, London W.C.

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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CO-OPERATION OF THE ENGINEER AND ARCHITECT.

MUCH discord and ugliness in our engineering and building works would be obviated if the engineer and the architect agreed between themselves upon fundamental principles. As construction is the common basis of both engineering and architecture, we might at least expect to discover some grounds for unanimity, or at least concession. Both professions use the same materials in their structures, and might be expected to find common principles of converting and using them. But even in this initial question there appears to be a divergence of opinion. We find the engineer not scrupulous about using his granite and stone in an almost wasteful manner in great masses of piers and foundations; he treats them as so much inert material unworthy of any design. The architect, on the contrary, breaks the masses up, distributes them in piers or other parts, and impresses an architectural character upon his stonework. Tons of brickwork are placed in bridge abutments and foundations, which the architect would seek to render effective and decorative. One seeks to use his masonry as a counterpoise or dead-weight; for the other to mould it and arrange it for the same purpose. The engineer of a work looks at stone and brick as inert dull matter; the architect as capable of embodying other attributes—of being impressed with mind and character. Even in the same house of the engineer, it is treated in the same solid manner; it is used to resist tension in rods and bars, cross-strain and crushing in shaped sections, without any other consideration of fitness. In fact, the difference between the engineer and architect's conception of material is equivalent to saying the one uses material mechanically, the other aesthetically; and this fundamental difference in the mode of use connotes the two conceptions of design. We must refer all the points that arise in question of design about bridge construction and other works of an architectural kind to this root-basis—the use and treatment of material. While material is considered only mechanically, or its physical properties, we cannot expect any design. It is the impossibility of conceiving any material as expressing any function that separates the work of the ordinary engineer from that of the architect.

In his remarks on the subject of bridge design before the Institute, the President, Mr. W. Emerson, touched on the relations of the engineer and architect as one of the necessary considerations bearing on the subject of monumental bridges. The Congress held last year led to a discussion between members of the engineering profession and architects, and a few principles were discussed. As we said last week incidentally, each of the professions must be made prepared to consider the views of the other. Architects must make themselves acquainted with those principles which the engineer accepts and upon which he works, and engineers must also put on one side their own predilections and come prepared to consider the problem from the architect's point of view. Or, as Mr. Emerson said, the architect must study the engineering of the construction, and become masters of the constructional problem, so as to put forward their own claims in an intelligible manner, instead of, as too often, ignoring the engineer's design and proposing something that is based

on certain preconceived views. In this way only—that of mutual compromise and concession—can any improvement be made possible. As an example of the independent spirit which each adopts, it may be noticed that in all the leading works on bridge construction written by engineers, no reference is made to architectural or æsthetic considerations, and in the latest edition of a recent and able treatise from the engineering side on "Bridge Construction," by W. T. Claxton Fidler, M.Inst.C.E., the author has not a single word to say on the subject of design viewed æsthetically, while he is compelled to admit that there are many points in the design of bridges that are not satisfactorily determined, and for which further experiments are needed before they can be applied upon correct and positive principles. Both with regard to the important questions of the working strength of iron and steel, and also as to the resistance of wind pressure, much more investigation is necessary. May not the æsthetic laws which govern all structures of this class have something to teach the engineer in these matters, or are we to look on the existing results of the experimentalist, imperfect as they are, as affording reliable and infallible data? It is admitted by nearly all bridge specialists in iron and steel that the rules that have been adopted must be considerably modified in the future. There is difference of opinion among engineers, for instance, in regard to the "working stress" to be applied to the proportions of an iron or steel bridge, or rather the question of what the proper adjustment of the working stress to a certain load is. What should be the proportions of stress as applied to different parts and members? Dividing the ultimate breaking weight of a bridge by a certain factor of safety is certainly a rather rule-of-thumb method, and is only applicable to a particular method of loading the structure. A bridge subjected to shocks, as in railway bridges, or rapidly moving loads, producing variations of stress, ought to have a lower working stress than a bridge with a steady load, and this has been generally followed in practice. But engineers differ in such things as the impact of the load, or the effect of a load suddenly applied, which, it is well known, produces a momentary deflection double that due to the same load at rest; but this is not taken into account in the design of the structure, and we have, as a result, a failure or sudden collapse. It is well known that a bar of steel that would bear a sudden load gradually applied would break when half that load is suddenly imposed. Sir W. Fairbairn's experiments have also proved that a girder of wrought iron can be broken by repeatedly applying a load one-half of the breaking load. But these facts have not always been taken into account by the engineer in his desire to economise. The curved rail surface will produce a sudden shock to the girders every time a train rapidly crosses, producing a pressure greater than that of the rolling load. Indeed, the effects produced by rapid rolling loads have not been clearly ascertained or formulated. Other questions still uncertain are the relative merits of different types of bridges from an economic point of view—as, for example, the most desirable form of railway bridge for long spans, and the variations of intensity of rolling loads in different parts of the span. As Mr. Claxton Fidler says, a very large allowance has to be made for the imperfect state of our knowledge; the construction of bridges cannot be conducted upon exact scientific principles. On these grounds we do not think the engineer can maintain the uncompromising position in bridge construction which he assumes.

The problem of designing a bridge will depend largely on local conditions, the circumstances, whether the bridge has to

span a river, a ravine, a public roadway; if intended as a bridge for ordinary or railway traffic, its height, the materials of the locality, the number and width of the spans. Practically, the duty of a bridge is to carry a certain load across a span or spans, and, canonically, its function has been described as to resist the "bending moments" due to the load. These structures may be roughly divided into girder bridges of which there are several kinds), arches, and suspension bridges. One writer divides the family of girder bridges into parallel girders, including cantilevers, parabolic girders, derived from the first group, including various types of structure and arches, and by the inversion of these forms another series is made, including suspension-bridges. These inverted types include, besides suspension forms, inverted-shaped cantilever bridges, parabolic and cantilever combined with bowstring—all of them types that have been evolved from the earlier forms of the girder, the arch or bowstring. The problem is to design a bridge, making use of one or other of these mechanical types that shall fulfil the conditions, and at the same time not offend our taste. The laws of æsthetics presuppose the observance of statical conditions. For example, in every arch with its abutments we look for a certain proportion of space or void and abutment that satisfies the mind, and such proportion, when found, will be statical. The equilibrated arch of masonry gives an agreeable curve; also with regard to arch thickness, the eye can immediately detect whether an arch is thick enough for a certain span—in fact, the visual test can generally be relied upon. So, too, æsthetic considerations would select a curve suitable to a given span and superimposed load. A flat or depressed arch would look weak for a long span, and would naturally suggest high piers carried up with inverted curves at the springing of all the arches, and this arrangement of loading over the haunches strictly agrees with the law of equilibrium of arches. In each of such instances the form that is pleasing to the eye will be found to correspond to the static laws, which graphic statics have done so much to illustrate. In the same way every architect is aware how he can depend on his own sense of stability or stiffness. Suppose it is a girder, the depth that appears to give the sense of rigidity, making allowance for difference of material, is generally the safe depth, and is borne out by the formula for obtaining depth. In a beam of wood, a greater depth would be looked for than in one of iron or steel. If we consider, therefore, the question from these two standpoints—one the want of agreement among engineers about various points of structural significance, the other the help which can be afforded by artistic considerations, and by using proportions agreeable to our eye and our sense of fitness, we might at least expect concessions to be made on each side. But we find those engaged in bridge construction not very desirous of meeting the architect, and this may be due to more than one reason. In America the design of structures of this class are mainly in the hands of expert bridge-builders, and only last year a new general specification for steel railway bridges was issued by the engineering department of the American Bridge Company, in which certain types of bridges are recommended. Thus for spans up to 20ft. rolled beams or longitudinal trough floors; for spans from 20ft. to 100ft., plate girders; for spans from 100ft. to 140ft., lattice girders; for spans over 140ft. pin-connected trusses. We wonder if any architects were consulted over this elaborate form of specification, which has over 100 clauses, and the design as well as detail specifics. Such a mode of reducing bridge construction to a set form of rules, is to deprive the architect of any participation in such work, and to favour "regulation" designs of the companies. The same Bridge Company has just

been successful in obtaining contracts for several steel bridges for the Uganda Railway. A bridge specification referring to such details as rivet pitch, lattice and pin connections, the kind of steel used and the loads to be carried, web areas, workmanship, &c., is enough; but the tendency is to fix on certain types, and in this way limit the question of design. The development of specialism in the American States is leading also to the same direction. Every large structure is placed in the hands of experts. No doubt, as we have shown lately, this is one reason why we have been invaded so much in our industries; but this practice, up to a certain point good, becomes pernicious when the personal factor in design is left out. The extent to which engineering in one branch or another has competed with the architect and entered modern building construction can only be realised when we look through a large modern building—say, an up-to-date hotel, with its foundations, heating, ventilating, lighting, lift machinery, and the motive power necessary. In these enterprises co-operation is necessary or required; but in the construction of bridges the engineer has his own way, and if an architect is consulted it is usually after the main structure has been designed, to give details for any ornamental parapet work or external decoration. But in every work in which the co-operation of the engineer and architect is required, it is essential that both should act from the initiation of the design. We consider it almost an insult for the architect to be called in to make a design for an elevation after the structure itself has been decided upon. It is certainly degrading architecture when it has to take a "back seat" or play the inferior rôle of decoration. Unless the principle of a structure is thoroughly understood, any attempt to find a suitable style of expression or ornament must result in failure more or less. Our Metropolitan bridges of iron are examples of the want of initial design. The structures of them, if we take for examples those of the Tower Bridge, of Blackfriars, Westminster, and Chelsea Suspension Bridge, appear to have been designed by engineers working independently of the architect, and afterwards decorated or clothed in styles that are in no sense appropriate to their structure. The Tower Bridge bascule piers are encaused to represent Medieval gateways of 15th-century design; Westminster is made to harmonise with Barry's adjacent Tudor pile. They give us good examples of structures initiated by the engineer and afterwards made presentable by the architect, in which the dual factors of engineering and decoration, instead of being conceived by one mind, fail to give us a unanimous expression. We might illustrate this separation in the conception of the design in other examples, where the engineer has failed to enlist the architect's aid at the right moment, with the result that we have a mechanical structure overlaid with ornament.

The co-operation of the professions calls for concessions on both sides. The architect must enter into the question from an engineer's point of view before he is able to advise or suggest any improvement in structure, which lies at the basis of the matter. Up till quite recent years the architect has held aloof from engineering, looking upon it rather disdainfully, as something foreign to his own art. The consequence was, that when he entered into the arena of controversy, all he could do was to denounce the engineer's work as being contrary to art, ugly and atrocious an eyesore. He begged the question, and argued in a vicious circle, without touching the arguments of his opponents. The engineer, on his side, severely resented these attacks, but laughed at them, being assured that he had facts and science on his side, and showed up the mistakes of engineering works designed by architects. And yet there are defects in both sides. The

architect has neglected mechanical principles, overlooked the claims of utility; but, on the other hand, has a certain amount of popular feeling with him. He can grasp a design as a whole better than the engineer, and can artistically express the conditions; on the other hand, the engineer, though more exact in his mechanical knowledge of loads and stresses, fails to give any expression that will satisfy the eye. He will often, for instance, so literally interpret the mathematical formulae as to create an impression of weakness and inconsequence. Each profession must approach the subject of design with a knowledge of the evaluations upon which the structure is to be based; the architect, as we have said, must study the problem mechanically before he can arrive at any conclusion that will justify him giving any expression to the lines of structure; the latter presupposes the first study. And the modern engineering point of view cannot be ignored altogether—steel, concrete, and other materials will be part of the equipment. When architects have advanced so far, we may expect a common ground or consensus of opinion, an agreement upon essential conditions, upon which co-operation of both professions may yield higher results in the future.

THE BUILDING TRADES.

WE have no desire to enter upon the thorny paths of trade-unionism, nor to justify the charges made by the writer in the *Times* in his article on the "new" unionism that has been the cause of so many labour conflicts and difficulties in connection with building. The writer refers particularly to trade-unionism of the more aggressive type, and its results in building operations. We here draw attention to the facts, as recorded in the article in question, leaving our readers to form their own conclusions. When foreign competition is threatening us in all our industries, the question is one that will excite attention. No one can dispute the fact that much of our trade is being transferred to America and other countries; but the reason of such transference is not so easily explained, although, no doubt it is true, trade-unionism may have been one of the indirect causes. "The newer unionism," the *Times* correspondent says, "would pass among economists under the artless title of 'restricting the output.' Among trade-unionists of the Socialistic type, who have no regard for courtesy titles, it is better known as 'Ca'-canny,' a nickname used during the shipping troubles. 'Ca'-canny' or 'go-easy' policy has been applied to building as well as other industries. We rather prefer the more scientific description 'restricting the output,' which is the principle complained of. Whether the principle of go-easy has been adopted in place of a strike, as asserted, we do not now consider; but the British working man is charged with adopting the policy;—in other words, the men are not to put forth their best efforts, so that others may be called in to help in the work, and that employment may be found for the largest number of hands. This is the principle that has been laid to the doors of the British working man. There is at least in it apparently a desire to obtain employment for all workers; but it is asserted, the aim is not philanthropic, but is an endeavour to place the employers at the mercy of the employed, and in this way to increase the wages. The adoption of the eight-hour system is, according to this theory, to bring in a certain proportion of the unemployed, and in this manner to make it easier for all workers. And as a consequence, it follows, the cost of production is increased to an extent that is endangering our industries and driving trade out of the country. These are the main arguments,

and they are to some extent true, that are put forward by the writer in the *Times*. We will not now comment upon them, but will make a few quotations from the article, so that our readers may form their own opinion. That the "Ca'-canny" or "go-easy" policy is being adopted generally, and is aided by the aggressive unionism, is the general view held among architects and employers of labour. There is an unwillingness to do a fair day's work for a fair day's pay. Builders complain that, instead of working ten hours, men do little more than eight hours' real work. The *Times* gives us some instances. In no other branch has the go-easy principle of restricting the output been more generally adopted than in the building trades. The men's societies, of course, do not prescribe such a policy. We are told, "It is a question of unwritten law discussed by the men when their lodge meetings are over. . . . There is no rule as to the precise number of bricks a man shall lay in the course of his day's labour; but there is a well-recognised unwritten law on the subject, which a bricklayer will disregard at his peril. Twenty years ago a bricklayer would lay his 1,000 bricks a day when on ordinary work. Thirty years ago the bricklayer employed on railway-tunnel work in London laid over 1,200 a day. But the unwritten law now in force declares that a bricklayer engaged even on ordinary work must 'go easy,' and not lay more than 400 a day. He will thus not only avoid compelling those who do not wish to do more to go faster, but he will give another man a chance." If a man exceeds a certain quantity he is taken to task by his co-workers. A story is told, on the authority of a master builder, that at one of his jobs a new hand who possessed all the energy of youth was put on one day, and he displayed such devotion to his work that the other bricklayers were dissatisfied, and counted up the number of bricks he had laid in the day, which was found to be 724. They gave him to understand that he need not turn up on the morrow, as they refused to work with him. The young man complained to the foreman, who replied that he was helpless, and put him on another job. He did his work at the same pace, and then had to leave from opposition of the same kind. The writer says, "The interference exercised by society men with newcomers: they desire to do their best, but are compelled by their fellow workmen to do as little as possible. The foreman, too, has much to contend against; in one case a foreman in the North of London who insisted on the bricklayers under him doing a fair day's work was repeatedly summoned before his lodge, and fined 5s. on each occasion for 'so-called sweating.' The writer says: "The maximum limit of 400 bricks per day is the recognised limit for dwelling-houses, shops, and business premises built by a private contractor. In the case of public buildings, and especially London County Council and London School Board work, the limit is considerably less." It is thought the former, by its direct employment of labour and trade-union sympathies, must be held responsible for these "go-easy" practices in the building trades. The *Times* writer says a firm of contractors in the East-end, in complaining of the number of bricks laid per day, were told that the L.C.C. limit is 330 bricks per day, and they declared they would not do more. Again, we are told that in one London Board school the average number of bricks laid was only 200 per day; while in another case mentioned a builder took account of the bricks laid by his men and found the "average only 70 bricks per man per day." We hear that at their last meeting the London County Council discussed the matter, and are making inquiries into the question. Some of the facts can be attested by anyone who has had experience of building, and are borne out by a letter written by

Wm. Woodward, F.R.I.B.A., in the *Times*, to which we shall refer. A Leeds correspondent asserts that the bricklayers in that city seldom exceed 300 bricks in nine hours, although each could lay 1,000 a day without any effort. As wages have gone up the adoption of the go-easy policy is all the more remarkable. Mr. Woodward says "the combined effect on the cost of labour has been such that whereas a plain wall would have been put up ten years ago for £12 to £14 per rod, such a wall would now cost from £20 to £22 per rod." Some allowance must be made for the increase of cost of bricks, though 10 per cent. of this is due to speculative prices on the part of brickmakers. It is true the average cost of labour has increased from £3 to 46 per rod during the last ten years. A story is told of one London builder who was anxious to find out how much the brickwork on a job was costing per rod. The men overheard something said to the foreman, and not one of them came back next day. The calculation was made, when it was found the labour bricklaying was costing 49 per rod, or one halfpenny per brick. We have an instance of the same policy with regard to carpenters and joiners. It is related that "when the Associated Society of Carpenters and Joiners found the masters were availing themselves of foreign help to overcome the Union, it called a strike to compel the builders not to use Swedish doors; but the attempt failed." From this cause the trade in Swedish window-frames and sashes has been developed, to the injury of our own English joinery. This work is sold at one-third the cost of English-made joinery. Other instances of bricklayers' strikes are given from the *Proceedings of the Operative Bricklayers' Society*; but the evidence we have given is sufficient. The non-unionists are subjected to much intimidation and annoyance, but there are many instances of men who have joined unions because of benefits conferred who have been compelled to obey rules and unwritten laws, at the risk of forfeiting the benefits for which they have been subscribing for many years. These are some of the evils complained of. It is not the architect's duty to interfere with this state of things, though Mr. Woodward, in his letter to the *Times*, says he took advantage of a clause in a contract to discharge two idle joiners when the foreman could not have dismissed in the circumstances. This writer complains of the cost of building, which has gone up 25 per cent. in as many years; of the delay in completing a building; of the cost of workmen's dwellings, and other buildings, like workhouses and asylums and board schools, which are erected to keep the British workmen employed. Some of the statements put forward may bear explanation. On the whole, we are afraid there is a good deal to be said to account for the easy-going policy—the contract system and under-estimating, which have led the trades to combine so as to protect their own interests. Another cause which the unions have had to combat is the overlapping in the trades—a system favoured by cheap contracts. Much confusion now exists as to saving, claimed both by masons, bricklayers, and plasterers; roof-tiling, which the bricklayer claims as his work as against the tiler; plumbing and sanitary work, heating, &c. These interferences of one tradesman with another have led to innumerable obstacles and hindrances in contract work, all tending to delay the completion of buildings, and to add materially to the cost. All this friction has been attributed to the easy-going or restricted-output theory to which we have referred. The question is one that will receive attention from master builders and architects. At present the building employer is the victim of all these trade rules and conflicts with the societies. The small masters are, perhaps, the largest sufferers, as they are at the mercy

of the several unions. Combination amongst them may meet the difficulty; but the great aim should be to restore an agreement with the unionists as to the quantity of bricks laid for different classes of work per day, and the amount of work that ought to be turned out in other trades. We have it asserted that in Leeds feuds between bricklayers and masons are very common, and the bricklayers' labourer is giving trouble. If a labourer attempts to carry eight bricks at a time, his comrades would at once stop work. These and other points of disagreement show the unsatisfactory condition of the trades.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fortnightly meeting of the Institute of Architects was held on Monday evening at 9, Conduit-street, W., the president, Mr. William Emerson, occupying the chair. Mr. ALEXANDER GRAHAM announced the decease of a well-known Fellow, and one of the oldest members on the roll, Mr. Frederick William Porter, and it was agreed to send a letter of condolence to the widow.

NOTES ON THE PRACTICE OF PICTORIAL MOSAIC.

MR. ROBERT ANNING BELL read a paper on this subject. Mosaic, the author observed, was a subject of artistic expression which had many advantages peculiar to itself, and which also had very definite limitations. It was obvious to anyone who had studied the work of the past that the realistic representation of natural effects, although it had been sometimes remarkably near success, was not the way to get the greatest effect from the use of the material. The material proclaimed itself at the outset as being unsuitable for realistic effects for two reasons. The first and strongest was the uniformity of its surface, which rendered it impossible to get that variety in the texture of the material which was the special reason why oil paint was so triumphantly superior to mosaic in the representation of the work of Nature; the second, the fact that it had to be applied in separate pieces with an interval, however small, between them. The tints could shade off into each other with quite the subtlety of paint, and the interstices formed a lacework of ground colour and shadow which was the same over the surface, and added to the monotony of the texture. The material, therefore, demanded a certain flatness as the effect to be aimed at, and, as a corollary to this, a certain archaism or stiffness in the design. This very flatness of effect imposed some restraint on the style of the design. It was not truly archaic, but was the fullest expression which the limits of the material permitted, and gave an artist plenty of elbow-room for his invention if he had any feeling for the method. For pictorial mosaic the subjects chosen must be such as are suitable to austere treatment. The play of facial expression or momentary gesture was out of court. The characters introduced could be likenesses, or the occasion of their introduction a mere incident; the characters should be types, the incidents symbolic. Discussing the

PRACTICAL QUESTIONS

of working and placing the mosaic, the author said that it should be some way from the eye, and a good deal higher up. Like many other good things, when you want it you want a lot of it; it is best of all when tinted covering a large space and unbroken by architectural mouldings. This applies more particularly to gold mosaic, which, when covering walls and domes, running round the arches, flashing into a glistening flake of light as it turns the corner, and covering every inch of space above the capitals of the columns, is much more effective in effect than when used in juxtaposition with stout arch mouldings and pilasters. Small panels of mosaic, the author said, he did not like at all, even where they are merely filled with conventional foliage, though that is better than the clumsy look of small figures close beside the smooth and exact forms of the mouldings which frame them.

IN INTERIOR WORK

gold mosaic—a treatment, that is, in which gold is largely employed—seems to be infinitely superior in effect to a treatment in colours only. The external work the author considers the use of gold a mistake. First, from the practical side,

owing to the construction of the tesserae, it was likely to be damaged by frost, as the film of glass which covered the gold-laid was very easily flaked off should any water get into the interstices; and secondly, from the æsthetic side, there was no mystery of shadow to bring out its peculiar beauties; it glittered so strongly in sunshine as to destroy the effect of the design of which it formed part, and it was inclined to look rather garish even in ordinary daylight. Treating of

COLOUR.

the author advised a light scheme of colour as preferable to a deep one. The cooler colours are pleasanter than the warm ones when used in any quantity. Much orange is peculiarly unpleasant, and even reds should be sparingly employed, and rather as accents to strengthen other colours than in masses for their own sakes. Blues and greens tell well at a distance; they are a charming quality, will keep their colour very fairly, though one needs to use a much brighter blue than might be expected if it is to be at all rich in effect. It may be taken as a general rule that differences of any light tint carry much further and tell much more strongly at a distance than similar differences in lower tints. A very slight difference will have a very marked effect, and it will tell less close to than some way off, whereas quite the opposite is true of strong colours, particularly red. The varieties of glass surfaces are very great, and the difference of quality in the glass has also a marked effect on its carrying power. As regards

TESSERÆ.

very great differences of sizes are inadvisable in figure-work. A few large pieces among a large number of small ones is unsatisfactory. If, however, large pieces are mainly used, a few small pieces here and there will rather enhance the effect. As an interesting example of this, Mr. Bersford Pitt's mosaic outside Pergami's Restaurant was cited. The effect is quite unlike what we are used to in mosaic, but the author would like to see more work done in this method. It has many advantages in a place like London. Dirt cannot easily settle on it, and when it does is easily washed off. It is permanent, and, as the pieces are so large, less labour is required than with ordinary mosaic. For outside work the author found that a scale larger than was generally seen in mosaic is to be used for good effect. Should varying sizes of tesserae be used generally over the work, any place where they are kept of uniform size will infallibly attract the attention by its regularity; this would be seen in a plaster forming part of the background of the panels at Horniman's Museum. Careful study should be given to

THE SIZE OF THE INTERSTICES.

In background work they can be quite large if the colour is not wanted to be very pure, the dull tint of the patty toning down or softening the brighter colouring. In such parts as faces, hands, or other details to which particular attention should be attracted, they may be quite close together, so making a comparatively solid mass of colour, and giving emphasis to the part. Indeed, in actual practice it would be difficult to work a face without keeping the tesserae as close as the tone of the interspaces would destroy the quiet modelling, which is all that is necessary or advisable. Remembering the limitations of the material, anything like truth of relative values or strength in the general effect of light and shade should not be attempted. Simplicity in modelling is the only way in which variety is obtainable where necessary by the relative strength of the colours used in different parts of the design. Realism of texture in draperies or other accessories should be avoided; trees, buildings, clouds, textiles, &c., should be felt to be rather symbolic than things to be changed into representations of them. The author treated of various matters and difficulties connected with the actual work of putting the mosaic upon the wall. His preference was for the method of doing the work *in situ*; as a good result cannot possibly be obtained by other means. The modern method, in which the author described, is open to the obvious objections that you cannot see the progress of the work, and it is impossible to make alterations as you go on. In translating the water-colour or pastel tints of the cartoons into coloured glass, a good deal of variety is possible, so that it is necessary to be always in such a position as to discuss with them which tint and quality of

less should be used, and sometimes to vary from the archon when the work already finished may suggest it. The setting of the mosaic is an essentially artistic craft, it is absurd of the designer to insist to say simply "Here is my copy, take it and copy it exactly." It is impossible to copy it anything like exactly, and consequently complete co-operation between designer and craftsman or crafts-woman—for it is one of the things that women do admirably—is absolutely necessary.

THE LIMITATIONS OF MOSAIC

Though the most splendid, as it is the most permanent, form of wall or ceiling adornment, mosaic is extremely arbitrary, and an attempt to stretch its limits is terribly punished. It will not easily put up with rivalry, and will not endure other methods of decoration in immediate juxtaposition. In interior work it quarrels with stained glass, and it destroys gilding, as may be seen in many a Roman church where the choir-arch and columns are gilt around an apse of mosaic. Outside, however, mosaic must be made dominant in the scheme of which it forms part. No colour can stand near it but in humble subordination, and its surface texture requires considerable art and discretion in the choice of neighbouring materials. Nobly used, it nobly repays; ignobly used, it does nothing but disgust. Mr. G. HARRISON TOWNSEND, in proposing a vote of thanks to the lecturer, said he agreed in the main with Mr. Anning Bell's views, and especially deprecated too pictorial a treatment for mural mosaic. It was gratifying to himself as a decorator, rather than a realist, to note that what told in mosaic was the mind of man. He did not believe successful work in decoration could be carried out by a firm, because no one had a personal interest in the work. The one idea of the manager or principal would be to obtain a profit on any commission, and he must employ for the work men who, if they were worth anything, would be working for themselves.

Mr. WALTER CRANE said he also was largely in agreement with Mr. Anning Bell. The pottery or cement played an important part in mosaic, giving the half-tones and producing the same effect as the mortar lines in a brick wall. The surface should not be kept in one plane, especially where gilding was introduced.

Mr. C. HARRISON TOWNSEND supported the vote of thanks, and remarked that the decay of mosaic art seemed to date from 1823, where old elements were substituted for the quick-setting lime contents previously used. The power to alter and correct was one of the causes of the decadence of Renaissance design in mosaic. It was all important for the progress of the art that the cement used by modern workers should be improvable.

Mr. T. R. SPENCE held that no mosaics should be brought nearer to the eye than 10ft.; he did not agree with Mr. Bell that mosaic should be kept apart from other forms of decoration; they ought to be made to harmonise together, and the aim of the mosaicist should be not to belittle or clash with his surroundings.

Mr. GEORGE BURR, as a practical worker, pointed out that the petty setting should never exceed half an inch, and a less thickness was desirable. The petty was composed of lime and boiled oil, the great desideratum being that the time was old, not less than two to three years in stock.

Mr. WILLIAM BENDISY pointed out that the old workers used lime and not putty and oil, in their mortars. Marble and half-brick were crushed up together in a mortar were still employed with great success in Italy. The Pompeian works had a very thin backing of pure lime mortar. In Italy nearly all mosaics were fixed back on paper, as was the case with the mosaics of the great point of working was, as in the old work at St. Mark, Venice, and St. Avole, Italy, to make the joints wide on convex surfaces and narrow on all concave surfaces. The work in the dome of St. Mark, Venice, had a dignity unparalleled in modern mosaics, and the cost for labour and time consumed was not beyond computation. He doubted whether the results of Mr. Anning Bell's method of laying the tesserae from the front compensated for the greatly increased outlay. The more points there were in mosaic the stronger it was, and the less likely for the tesserae to drop out. He was not sure of the stability of all the recent work at St. Paul's.

Mr. W. W. WOOD referred to the masterly brilliancy and variety of Sir William

Richmond's mosaics at St. Paul's over earlier work executed in that cathedral.

Lieut.-Col. LENOX PRANDERGEST and the President having also spoken, Mr. ANNING BELL briefly replied on the discussion, and acknowledged the vote of thanks.

THE ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Architectural Association was held on Friday evening at 9, Conduit-street, W., Mr. G. B. Carvill, Vice-President, in the chair. The following sixteen new members were elected:—E. S. Barr, J. R. Bucknill, J. Biset, W. J. Debridge, J. H. Goodchild, C. L. Hampton, G. O. Howship, A. S. Jones, E. J. Kallenborn, E. G. Millar, D. W. Pollock, E. Pitt, H. Sandford, W. J. M. Thomasson, A. H. Whyte, and E. H. Walker. The President nominated for the vacancy on the committee caused by the resignation of Mr. Arthur T. Bolton, on being elected headmaster of the Day School, Mr. R. H. Wymouth, whose name stood highest on the list of those not elected at the recent election—a proposal received with applause.

THE NEW PREMISES FUND: AN AUSPICIOUS BEGINNING.

THE President said that he had great pleasure in stating that the following donations had been already given or promised for the New Premises Fund:—Mr. J. MacVicar Anderson, £250; the late Mr. Arthur Bates, £250; Mr. Henry L. Florence, £250; Mr. Arnold Mitchell, £200; Mr. Aston Webb, A.R.A., £200; Mr. E. A. Gruning, £100; Messrs. Alfred Waterhouse and Paul Waterhouse, £100; Mr. A. Brawell Thomas, £50; Mr. William Emerson, F.R.I.B.A., £50; Mr. T. M. Rickman, £50; Mr. W. Howard Sedg-Smith, F.A.S., £50; the late Mr. William Young, £50; Mr. Henry L. Blomfield, £25; Mr. G. H. Fellowes-Prynce, £25; Mr. A. E. Street, £21; Mr. Walter Emerson, £5 5s.; and Mr. W. L. Trant Brown, £5 5s. The President added, amid hearty applause, that he regarded that as a very good start.

THE SANITATION OF A COUNTRY HOUSE.

The following paper on this subject, illustrated by many large-scale coloured diagrams, and by specimens of suitable and unsuitable fittings, was read by Mr. MAX CLARKE.

I was led, he remarked, to think seriously of the subject of sanitation by the fact that many years ago was walking through the streets of a provincial city with a friend, he had with him a clerk of works, who was engaged upon some of the buildings in course of erection, and had been upon others. Pointing to a pipe against a wall, this gentleman said, as well as I recollect, "The authorities are under the impression that is a ventilation-pipe, but I just stuck the end of it into the ground, and it looks all right and does no harm." This remark made a great impression upon me, as I could not help turning over in my mind, were the authorities at fault in asking for a ventilating-pipe, or was the man at fault in so deceiving them? I always hope the architect knew nothing of the transaction, but he should have done so if he did his duty. Now let me for a moment substitute the word

"HYGIENE"

for "sanitation." The explanation in a dictionary of the word "sanitary" is "pertaining to, or designed to secure health," and of the word "hygiene" is "science which treats of the preservation of health." There does not seem to be much difference between the two definitions that I might not substitute the latter for the former word. Now turn with me to the introduction to Parkes's "Hygiene"; the first paragraph is as follows:—"Hygiene is the art of preserving health—that is, of obtaining the most perfect action of body and mind during as long as is consistent with the laws of life. In other words, it aims at rendering growth more perfect, decay less rapid, life more vigorous, death more remote." This paragraph I consider the most admirable definition of "Hygiene." Just fancy for the architect what the above paragraph means; that each one has it in his power to assist in such an endeavour, which it is not only his duty, but also a great measure the whole state of mankind, because that is what it really means, "the most perfect action of the body and mind." Is this not what we are all aiming at in various ways, or should be? Now, let me ask, how many of the architects in the United Kingdom have a copy of this parti-

cular work in their library? How many have given it the consideration it deserves, or deem it one of the main objects of their lives to further the objects it treats of? If I can only bring some of them, and particularly some of the rising generation, to read the first few chapters of "Architecture" embraces such a duty to the whole of mankind, I shall have accomplished something. There are many different views as to what the duties of an architect are. They seem to me largely to turn on how much an architect should do or can do for 5 per cent. Lengthy articles have been written on the duties as an arbitrator and such like, but where does one read of his duties in "rendering growth more perfect, decay less rapid, life more vigorous, and death more remote?"

WHAT SHOULD BE INCLUDED IN ARCHITECTS' RESPONSIBILITIES.

It is a difficult matter to decide what we should as architects do ourselves and what leave to others. For my own part I see nothing wrong in employing another man to do that for me which I know he can do better than I could myself—the only difficulty to me is, who is to pay him? Personally I feel I should, if I undertook to do work for such-and-such a percentage, and if I were quite sure that my client got the advantage of the best information on the subject. Now you may say, "For my own part I do not think of employing another man to do that for me which I know he can do better than I could myself." And my reply is this, that I look upon the title of the paper from the very broadest point of view; it not only concerns the drains and pipes, but it deals with almost the whole structure from foundations to roof-tree, and it is only by an architect having in view the benefit of the whole community at large that he will have fulfilled his duty to mankind in general and his client in particular, not to speak of himself, because no matter what the matter in hand may be, he is morally, if not legally, responsible for the result of his work, whether, in fact, it is a benefit to posterity or the reverse. I do not think this view of the case is brought home often enough to architects, and I take this opportunity of pressing it upon the younger members of the Association, for it is to those I am here to speak. The older ones, I hope, know as much about sanitation and hygiene as I do myself; whether these two items always get the consideration they deserve from men in practice is another question. The more one gets to what some of us call "rock-bottom" facts the better will our work be, whether it be as an art or profession, so I am going to give you a few instances of cases which have come before me. Some few years ago I had something to do with a building where the architect had, presumably, great confidence in his clerk of works and foreman—at any rate, they were given plenty of the drains, and neither very up with it, nor very bad, and the work was done. A short time afterwards, from various causes, the drains were overhauled, and it was found that there was one length of 9in. pipe into which several 6in. pipes were branched, and on the 9in. pipe, between each of the 6in. branches, a 9in. siphon-trap was discovered, each trap being quite full of water, and the water in the siphon-traps in a length of about 60ft. I heard of a case the other day, equally interesting, but from another point of view. At a house in the country, built not long ago, lately from some cause the drainage had to be examined, and was found to be defective. An architect was employed to put matters right, and his way of doing it was to write a very up with it, and the water in the traps, and put in new where he considered necessary, no supervision beyond a casual inspection being exercised over the country builder or what he "considered necessary." My point is, that papers might be read here and elsewhere till Doomsday without any practical result, unless men take a different view of their responsibilities from those just quoted. Having pointed out to you what I consider the responsibilities of an architect are in connection with sanitation, it now remains to get an idea what are the sanitary requirements of any house, as I do not believe we should build any worse for the poor than we should for the rich, so far as sanitation goes. We must not, however, let us not let it be as it seldom falls to the lot of an architect to decide on the first, and any man worthy of the name of architect would deal to the best of his ability with the two latter items, on which there is plenty of information to be had, and they are not matters, which require supervision.

SUBSOIL DRAINAGE.

The lie of the ground requires most careful consideration, and the drainage of the subsoil, if such is required, always bearing in mind that it is better to lay land drains so that they convey water away from the house than towards it. I saw a scheme a little time ago arranged to convey all the surface water in a pipe under the outside of a house when it would have been quite possible to take it away at the sides of the house. Land drains or agricultural pipes are liable to get blocked up at times, which should be borne in mind when laying them. The general drainage I shall speak of later.

FOUNDATIONS AND CONCRETE.

The foundations should receive careful consideration even in the country, taking care in a clay district to carry them well down beyond the level disturbed by droughts; if this were done we should not hear of so many cracked buildings and underpinning jobs, which, though money-making for the architect, are not pleasant for the client. In connection with the foundations, let me remind you that Portland cement requires more examination and attention than it is now given, and that it is not so easily and very difficult to get it sufficiently air-slaked—or, in other words, it is, as a rule, used when it is too fresh; it sets so rapidly that it is partly set before it is used in brickwork, drainwork, or concrete, and if knocked up again, of course, it is not the best. It is also more likely to blow or expand when used for concrete, for a number of stoneware pipe-collars fractured which are to be met with.

DAMP-COURSES OVER AREA OF BUILDINGS.

Covering the area of buildings with Portland cement concrete, as required by many authorities, is for the purpose of keeping down ground damp, which, where there is no concrete or other damp-proof course, is liable to be drawn up in the building when the latter is heated, the damp or noxious emanations coming from great distances where the earth is light or porous. In this way sewer-gas may be brought into a building from defective sewers existing at a considerable distance. In order to prevent this, care should be taken that the cement is sound and slow-setting, and that the concrete is not porous; the aggregate not being too large, such for instance as brickbats, which one often sees in concrete. The surface should be well beaten down and smoothed over with a shovel so as to form an impervious face, even if the concrete is only to act as a damp-proof course, and not as a floor.

DAMP-COURSES.

Damp-courses in walls should receive great attention. The very old-fashioned clause to be found in specifications, "two courses of stout old slates bedded in cement," should be abolished, as it is very difficult to get stout slates, either old or new, the usual type being so very thin that they break easily and are often damaged before the wall is built upon them. Asphalt often suffers from being laid upon the walls and then used as a gangway by the men on the works, or is otherwise damaged by moving materials upon the walls before the brickwork is continued up over the damp-course. Whatever the material for the wall it should be carefully protected until the superincumbent walls are built, then we may assume that we have done all that can be done to insure a perfect layer of material to prevent damp rising, do not give an opinion as to the best material to use, but let it be taken in its use. In connection with damp-courses and floors, I doubt if sufficient attention is paid to cases where there are wood floors with a space under one side of a wall and tiles or mosaic with concrete under at the other side. Then some precaution is required to prevent the damp getting from the earth and concrete on the side of the wall to the flooring and timbers on the other side. Numerous methods can be adopted, but they are usually conspicuous by their absence.

VERTICAL DAMP-COURSES.

Vertical damp-courses or dry areas are most important to rooms underground. I do not think there can be any doubt that, where a wide area cannot be obtained, covering the external face of the walls with a double thickness of asphalt is the very best means of keeping out damp, the asphalt forming a horizontal damp-course at the bottom and extending vertically above the level of the surrounding earth. My experience of hot compositions poured into a cavity in the wall is, that

such care is necessary to prevent mortar droppings getting down, and to insure the hot material getting down and adhering to that already in, I shall not risk it. The external application I can see and examine; the internal I have no means of knowing whether it is in as it should be, or not. Ventilation under floors should be attended to, sleeper walls being built open to allow of currents of air through the open spaces. One forgets at times that putting in an air brick to the space under one room and carrying up the brickwork close under the floor all round without any openings other than the one is not ventilation—it is only leaving a hole. All holes made in walls should have a fall outwards to prevent wet being driven in. Bedding wall or pole plates in main walls at the ground level is a mistake; they should always be carried on corbels, piers, or independent walls. In connection with this, I think hoop-iron, well tarred and sanded, is to be preferred to wood wall-plates.

WALLS.

With regard to the walls, what shall I say? That you should avoid, if possible, using 9in. bricks, and that, if you use them, you should try to build a house costing, say, £2,600, all the outer walls being 9in. brick, and particularly when the bricks are porous, as so many are nowadays, put together with poor mortar, and not even damp before laying. Of all the simple requirements in building, I do not think there is any single one I have so much difficulty in getting carried out as wetting the bricks well before they are laid; if this is not done, the dry brick absorbs all the moisture out of the mortar so rapidly that the material is little better than dust or dry mud. Hollow walls require attention to that the cavity extends below the level of the interior; also the thickness of the wall should be allowed to drop down the cavity and rest on the wall, thus forming a means for the damp to pass from the exterior to the interior lining of the wall. The lead covering of lintels or arches over openings in hollow walls requires attention to facing the ends of the lead being welded and turned so as to direct the moisture to the outer wall. I have had some experience in building with granite; it is a mistake to allow through or bond-stones to extend to the inside face of the wall, as damp patches are usually found where the ends of these long stones come. This is, of course, where neither brick lining or "strapping" is used. Scotch term for battening and plaster are used.

ROOFS.

Some points in roofs require attention: one of the most important to my mind being in cases where eaves gutters rest on the tops of walls or on oversailing courses. It is a practical impossibility to make a cast-iron eave gutter perfectly watertight; therefore short lengths of lead should be fixed on the top of the walls at each joint in the gutter, to take the water which escapes from the joint away beyond the face of the wall, not allowing it to percolate into the brick and stone, and so form a very unsanitary spot, as well as an eyesore on the inside. These pieces of lead should be soldered at its edges, and of the other edges the back should be turned up and the front edge turned slightly down where beyond the outer face of the wall. Down-pipes are too large and too numerous in most buildings, where gulleys have to be fixed at the bottom of each stack, involving unnecessary drains and extra work clearing out, &c. The pipes should always be fixed so that they are clear of the walls in case of leakage. "Soakers," which are more usual in the North than in the South, are better in every way than either secret gutters or flashing, the good flashing being less liable to damage than flashing laid on roof slates. Soakers should make a good finish to hips where the taste of the architect does not permit of hip tiles, slate, or lead coverings; the slates can be cut to a close joint down the angle. Slates of a greater width than the ordinary size should be used in these positions, so that no very narrow strips or small angle-pieces are used. These usually have only one nail or peg, and are very liable to get broken and fall off. Two courses of slating battens, the lower one vertical and the upper horizontal, is a good method of obtaining an air-space in roof construction, and so rendering the interior less liable to be affected by changes of temperature. But slates are class specified and have only one quality, the cheapest, which is often seen on work, is not a desirable article. Silicate cotton

or slag-wool is a most admirable non-conductor, as well as being a sanitary material, to be used in almost all cases where hair-felt is so often used, the latter being a happy hunting-ground for all sorts of vermin, whereas the slag-wool is, to them, most objectionable. This applies to roof coverings, pugging in floors, "lagging" or covering pipes of all sorts, and for other purposes a good non-conducting material is used for. I need hardly refer to the fact that the common floor with wood joists, floorboards, and ceiling plastered is not a "sanitary" floor, but it will be some time yet before we can get a solid floor of any sort used in country houses, even of the better class, so I need not go into the difficulties of any of the varieties, either as to cost or execution; but with regard to partitions, the stud partition, of "quartering" plastered both sides, should be assigned to the past; porous and punny bricks, breeze concrete, perforated and solid plaster slabs and solid plaster on expanded metal are all so much superior that their use should be universal even in country houses. Building the tops of chimneys in cement and the insertion of proper damp-courses in them should be a matter of common practice; but more attention is often paid to the question how to get a chimney to draw, or not to smoke, without recourse to a chimney-pot, than to whether the damp-course has been properly put in. The architect who has been called in once to *try* and cure a bad case of "dry rot" in a house will need no reminder as to the necessity of making provision against such a misfortune arising in one of his own buildings, or one who has lived during a cold winter in a country house with no means of heating the hall or passages, will bear in mind the necessity of heating arrangements, the nature of which we need not discuss. Avoid any system which combines heating and a supply of hot water for domestic purposes, unless the former be of the most limited description.

WINDOWS.

The height of rooms, the lighting of them by suitable windows, and if no fireplaces are provided, some means for the circulation of air, are not nature to use the word ventilate in connection with this. Even the cistern rooms should be well lighted; although the water is not the better for any light. The height of the windows with relation to the floor and ceiling requires attention, many of the building regulations having claims on the subject. I have seen a picture gallery, when a picturesque window, or, mayhap, several of them, have been arranged in the roof, to receive a polite request from the authorities to alter so as to conform to by-law so and so. High bottom beads or rails to double-hung sashes as a simple inlet for air are not made use of as often as they should; and a simple paneled shutter step to prevent wet coming in at these points when heavy gales blow directly on windows, as is so often the case in exposed situations in the country. A splayed notch on the outside of the bottom bead is an additional safeguard against water, but do not cut the notch on the inside down, as illustrated in a well-known work on specifications—evidently a slip, but still liable to be copied by the beginner.

SOME SANITARY ITEMS.

We may now turn to the matters which are more usually known as sanitary. It is really to impress upon you how many sanitary items there are which require your personal attention, and which you cannot have over a general reference to your pet architect. He, or man, if he is a little above the average, may tear his hair when he finds water-closets, baths, lavatories, and sinks dotted about all over the plan, causing him the greatest difficulty in dealing with the arrangements, if and he be in mind I say "if," you have not got the matter under consideration it requires for the first. We shall presume all things are in order, and the water-closets are grouped fairly well in one part of the building, as few outlying ones as possible, baths not over rooms where the flow of water from a quick waste-pipe will disturb the occupants of the room below, and where, if they are to occur as little damage as possible will be done. All these are in order, and we shall now consider the

FITTINGS AND DRAINS.

First of all, the more simple the fittings are the less future trouble and cost will be, and this is a matter of some importance in outlying country districts. I spend a short time every year at a house where if a plumber is required he

water-closets, and with this lead safety unsightly. The above floor is preferable, or perhaps a cast-iron slab if fens will permit. The wastes from baths, sinks, and lavatories should be ample in size to permit of quick discharge, and the outlet should be of sufficient area to properly fill the waste-pipe. The latter should, in my opinion, discharge into an open lead outside, so that the traps may not be siphoned out. I think this is a better method than having long continuous wastes fitted with antiphon pipes.

LAVATORIES AND SINKS.

The number of lavatories and sinks from which we can select is so large that all tastes are catered for. Those having complicated fittings should always have lead safes under in case of leakage. In houses to be avoided, as they become receptacles for dirt and objectionable things in general. Every fitting of this nature should have a proper overflow. I have had considerable trouble with sinks for hot water washing-up, in cases where glazed ware was unsuitable, and have tried wood lined with lead, zinc, and tinned copper, but they all proved practically useless in a very short time in cases where there was much washing-up to do with hot water. 2-in. lead put together with red lead, galvanised bolts, and brass screws being the only form of sink suitable for this class of work; in this case I have had the waste-plugs made hollow and of sufficient height to form an overflow. Care should be taken to have a proper grating in the waste-washer, which can be removed, but not too easily taken out, otherwise it is never in use place, and pipes get blocked up. Angle strainers in sinks are a useful addition in this respect, if the domestics can only be induced to make use of them. The vexed question of housemaids' sinks should be considered: what its use should be, and to what extent they should be provided. Except in large houses, a stop-sink should be used for everything the stop-pails into; but when a stop-sink is required, it should resemble a water-closet—not have a grating or anything of that nature to the outlet. The latter are only suitable for fixing under hot or cold draw-off taps, which should be provided in the housemaid's closet. The latter should be light and airy, not, as so many are, in a dark, confined, and smelly place. If a real stop-sink is provided, it must be fitted with a ventilated soil-pipe and antiphon-pipe, exactly as a water-closet would. All sinks should have high backs or some other means of preventing the wall or inclosure from getting wet. Slabs of marble, tiles, rendering with Portland cement, all answer the same purpose. No space for water to trickle down should be left behind sinks of any description.

TRAPS.

Usually of drawn lead, should be fixed under all fittings, with brass draining screw, the latter having a square or oblong projection for unscrewing, not a couple of small holes, or an indentation requiring a special tool to unscrew it. A little time ago I spent an hour with a plumber getting out a screw-cap to a sink waste; if it had had a projection to fit a spanner, it could have been removed in one minute.

CONNECTIONS.

With regard to fittings generally, there seems to be a great laxity amongst men who do this class of work—both those who specify and those who execute—as to connections between fittings and lead pipes. These should always be made with "unions and flynuts." As a rule, the "union" portion is omitted. Say, for instance, connecting a stopcock: more often than not both ends are simply "tinned" and the joints wiped, so that to get the cock off for repairs the pipe must be cut in two places, and two new joints made when it is refixed. If proper unions were fitted in the first instance, they could be unscrewed, and screwed up again without damage to pipes or fittings or a useless expenditure of time. It would be well if all architects, and, indeed, their clients also, would understand that the term "tinned fitting" will keep itself clean, but that there are no corners or angles, or the like, where dirt can accumulate. Baths, lavatories, sinks, and water-closets particularly require "allow-grass." The daily application of a closet-brush to water-losets would prevent such filthy traps as are on exhibition in too many houses of even the better class.

and with this lead safety unsightly. The above floor is preferable, or perhaps a cast-iron slab if fens will permit. The wastes from baths, sinks, and lavatories should be ample in size to permit of quick discharge, and the outlet should be of sufficient area to properly fill the waste-pipe. The latter should, in my opinion, discharge into an open lead outside, so that the traps may not be siphoned out. I think this is a better method than having long continuous wastes fitted with antiphon pipes.

LAVATORIES AND SINKS.

The number of lavatories and sinks from which we can select is so large that all tastes are catered for. Those having complicated fittings should always have lead safes under in case of leakage. In houses to be avoided, as they become receptacles for dirt and objectionable things in general. Every fitting of this nature should have a proper overflow. I have had considerable trouble with sinks for hot water washing-up, in cases where glazed ware was unsuitable, and have tried wood lined with lead, zinc, and tinned copper, but they all proved practically useless in a very short time in cases where there was much washing-up to do with hot water. 2-in. lead put together with red lead, galvanised bolts, and brass screws being the only form of sink suitable for this class of work; in this case I have had the waste-plugs made hollow and of sufficient height to form an overflow. Care should be taken to have a proper grating in the waste-washer, which can be removed, but not too easily taken out, otherwise it is never in use place, and pipes get blocked up. Angle strainers in sinks are a useful addition in this respect, if the domestics can only be induced to make use of them. The vexed question of housemaids' sinks should be considered: what its use should be, and to what extent they should be provided. Except in large houses, a stop-sink should be used for everything the stop-pails into; but when a stop-sink is required, it should resemble a water-closet—not have a grating or anything of that nature to the outlet. The latter are only suitable for fixing under hot or cold draw-off taps, which should be provided in the housemaid's closet. The latter should be light and airy, not, as so many are, in a dark, confined, and smelly place. If a real stop-sink is provided, it must be fitted with a ventilated soil-pipe and antiphon-pipe, exactly as a water-closet would. All sinks should have high backs or some other means of preventing the wall or inclosure from getting wet. Slabs of marble, tiles, rendering with Portland cement, all answer the same purpose. No space for water to trickle down should be left behind sinks of any description.

TRAPS.

Usually of drawn lead, should be fixed under all fittings, with brass draining screw, the latter having a square or oblong projection for unscrewing, not a couple of small holes, or an indentation requiring a special tool to unscrew it. A little time ago I spent an hour with a plumber getting out a screw-cap to a sink waste; if it had had a projection to fit a spanner, it could have been removed in one minute.

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THE SUPPLY OF WATER.

To any house, country or otherwise, is a matter

which should receive careful attention, but particularly in the country. Very often the difficulties are increased by the supply being limited from various causes, such, for instance, as want of power to pump the water up to the required level. The Camdull system of wire cable, hoists, and petroleum engines, all serve the purpose when natural gravitation is not available. Pipes for water service should be considered, with regard to the nature of the water, particularly in some localities where both the water and the earth may cause deterioration of lead, the water thereby being contained in the above cause. I show you a piece of lead pipe taken from a house near Bedford some time ago, the exterior run away by some action of the earth in which it was laid; some hundreds of yards had to be renewed in this case. I laid some lead pipes in the neighbourhood in trenches which were filled with sand and gravel, with which the pipes were surrounded to prevent damage from the above cause. Lead lined with tin or iron lined with glass are very good, but are expensive, and the former require special joints.

CISTERNS.

The storage of water is, of course, a debated point. Personally, I am for storage, as I consider it can be carried out with very little fear of contamination, and it saves many a trouble when there is a hitch in the supply. In a country house a supply of water for drinking and cooking purposes can be stored in a glazed stoneware tank if a slate or galvanised iron one is not considered good enough, either white or buff, which, with occasional cleaning, is about the most sanitary article which can be stored. The general supply can be stored in a galvanised wrought-iron cistern, or cast-iron, or steel-plate. If the size is large the galvanising and covers many of the little projections left in the process. I need hardly remind you that close-fitting covers to the cisterns are essential: that the cisterns should, if possible, not be placed where the water is liable to freeze in cold weather. Near a chimney is a good position, other matters being equal. Ease of access should be considered for cleaning out, and safes under are always advisable in case of accidental overflow. The position of outlet's deserves attention. They should always be in the side of the cisterns, so that dirt cannot get down the pipes, and if a supply is taken off for hot water, it should always be taken out of the cistern below the general cold-water supply, otherwise it is dangerous to mix the two. A water system without water in times of scarcity. Stop-cocks, with unions and large wheel-holes, so as to be easily turned, are necessary. Wrapping the pipe with slag-wool made upon canvas is desirable, and where casings are fixed they should be easily removable, not nominally so, as is so frequent. One further point to be noted is that the cisterns should be on the market which are intended for use as a reserve only, the supply under ordinary circumstances coming direct from the service-pipe and not passing through the cistern. I am not in favour of this arrangement, as the water might be in the reserve for so long a period that its use might be undesirable. I think we may now turn to the

SOIL-PIPES AND DRAINS.

dealing with the former first. Naturally lead is the most suitable material, except in cases where large quantities of hot water alternating with cold have to be dealt with; under these circumstances, the more durable, more elastic, the lead is buckled and at times cracked by the alternate heating and cooling. The connection of the soil-pipe to the drain is often not carried out as it should be; if the soil-pipe be 3-in. in diameter, and there is no necessity for its being larger, the brass tail-pieces usually sold have a narrow flange, so that it will not fit the collar of the drain, but slip right down, a wide flange bearing all round on the stoneware socket should be specified and insisted upon; the tail-piece should be lined with the lead pipe, whole length, the latter dressed over the flange all round, and the joint wiped round the top edge; the whole length of the tail-piece should show

of the best style of lead, and the house projection well. I have seen a number of water-closets, very useful in some cases, but not actually inside the house, and the house projection well. I have seen a number of water-closets, very useful in some cases, but not actually inside the house, and the house projection well. I have seen a number of water-closets, very useful in some cases, but not actually inside the house, and the house projection well.

above the ground level, and the joint to the drain to be made of well cemented flange and to be covered hard. A sufficient number of tacks should be put to lead soil-pipes, not less than every 5ft. in pairs on both sides; bends should, of course, be avoided where possible; the soil-pipes should be carried up to a sufficient height to insure the gases coming from them being taken away clear of windows and ventilators; but on the side of chimneys finishing close to the chimney-pots, in which case there is a great probability that as the air from the drain comes up the ventilating-pipe it will go down the smoke-flue, in many of which there is a down draught except during the time there is a fire actually in the stove. Guards of some sort should be fixed on the tops of soil-pipes to prevent birds building, leaves, &c., getting in. Branches into soil-pipes should be arranged so as to avoid joints being in the thickness of walls, and the connections of water-closets to the branch pieces should be carefully attended to. Now as to

DRAINS AND DRAIN-PIPES.

As a rule the drains are a simple matter, if one only could get perfect joints, and it is to improve these that the most attention should be given at the present time. Certain points should always have careful attention: for instance, where there are separate soil and rain-water drains the former should always be laid below the latter. If the rain-water be stored for use, the joints of the pipes conveying it should be most carefully made, as it is possible for water to get into the pipes from the surrounding earth as well as to get out, and the quality of that getting in may be very objectionable. One of the chief difficulties in laying drain-pipes is to get a true alignment at the joints, so that each pipe may be laid in continuity with those adjoining. With the ordinary joint this is a matter entirely depending on the skill of the individual who lays and joints the pipes. The cement exuding when the pipes are pushed up together is another difficulty, careful wiping out of the pipes at each joint being the only remedy for this most frequent defect. To obviate these difficulties some use gasket or hemp bound round the end of the spigot, to make the end of the pipe fit close and concentric; but the pipes with a ring of composition on the spigots and sockets and a cement joint outside provide the best methods of avoiding difficulties of this nature, and taking a great deal of trouble to get the man to actually lay the pipes. The concrete on which the drains are laid is a matter on which much difference of opinion exists. One of the latest text-books advises a bed of concrete about 6in. thick, laid to a regular fall, on which the pipes are to be laid, the space under the body of the pipe then being packed up with concrete. I do not consider this a good plan. I suggest that a bed of concrete 6in. or 8in. thick be laid with indentations at regular intervals for the collars of the pipes, allowing room enough to make the joint. The whole length of the pipe bearing on the concrete renders the lengths much less easily knocked out of position by accident. When each length is completed, a benching at the side, up to the middle of the pipe, is sufficient. Except to resist external damage, there is no object to be gained in surrounding pipes entirely with the ordinary concrete, which is of too porous a nature to be a satisfactory barrier against the escape of gas from defective pipes or joints. Of course, if a pipe, surrounded with concrete, say 18in. or 20in. square, is to be looked upon as a beam, then it is superior to a pipe with benching up to its middle only; but we should always try and get a sufficiently good foundation for our drains to enable us to discard the beam theory. It is, of course, necessary to protect pipes from the shock of heavy vehicles passing over them, and such like. The concrete should be properly made with clean material, and where the earth falls in upon it when the pipes are being laid, it, viz., the earth, should be carefully cleaned off the surface before the additional layer of concrete is put down, otherwise there will be two distinct layers not connected with each other. I need not trouble you with any remarks as to the size of drains, their inclination, whether they should be cast-iron or cast iron; these are more matters of detail, which can be decided to suit the circumstances of each particular case. If we turn to the construction of

MANHOLES.

inpection chambers, a few remarks are necessary. If built of bricks, I do not consider

footings necessary to the walls; in ordinary earth, a shallow concrete extending to the external face of the wall is sufficient. I prefer rendering the interior with Portland cement to the well-glazed brick; the joints in the latter take away any benefit gained by the glazed surface of the brick. Some say that hot water damages the rendering; but as hot water does not often rise above the rendering, I have not found the damage occur. The benching should be steeper than is usual, and of a convex section, so that the solids washed upon the inclined surface may slide into the central channel. The objection as to this form being convenient to stand upon and so on need not be considered. Manhole covers should always be made of iron, as it is quite a cheap cost. In the country, where every manhole would be out of doors and not close to the house, the airtight quality of a cover is not of so much importance as it is in towns. Turning to what is usually called the "air inlet," unless it can be placed in an unfrequented position, it should always be guarded at least 8ft. high, without any mica flap or valve of any sort; these are a delusion, they get out of order so easily, and their use as at present in towns will not continue very long. It is an accepted fact that there is an up-current in most ventilated soil-pipes under the circumstances, but when the water-closet on the soil-pipe is used, it reverses the current for the time and drives the air out at the first available outlet, which is usually the so-called "inlet." For this reason, particularly in towns, the inlet should be carried up above all windows and the like; but in the country, a top flange, similar to the drain, taken out, say, 8ft., with a bend and wire guard at the top, to prevent leaves and so on getting in, is quite sufficient—perhaps more than sufficient some will say because they will advocate a grating, say, 18in. square, close to the ground level. Over-look from rainwater tanks should not, under any circumstances, be connected to soil drains, nor should surface-water drains, even with trap fixed on the outlet, unless some lengths of open channel intervene between the trap on the surface-water drain and the connection to the soil drain.

SEWAGE DISPOSAL.

In many districts the disposal of the sewage of a country house is a great difficulty where there are no sewers in the neighbourhood and the pollution of the water is very objectionable. In such cases it is perhaps desirable to consider the advisability of having a separate system of drains to take the wastes from baths, lavatories, and fittings which do not take solid filth with a tank, the contents of which can be used for watering gardens and the like; this would greatly reduce the amount of liquid waste. The sewage or excremental filth portion can then be dealt with by some one of the forms of bacterial treatment, known by the various names of bacterial filters, septic tanks, and such like. The treatment should be a form in which the sewage is passed first through a closed tank, and then through filters exposed to the light. I heard of the arrangement now known as the "bacterial tank" from a member of the Architectural Association a good many years ago, as Moun's Automatic Scavenger (patented in 1882), a description of which can be seen in the *Proceedings of the Institution of Civil Engineers*, vol. LXV., page 450, 1881-82; Vol. LXVII., page 32, 1882-3; Vol. LXXVIII., page 502, 1884. From these notes I had an "automatic scavenger" constructed in the latter part of 1893 at a private house I was then building, in the hope that it would render the sewage less offensive. This it has done satisfactorily, and, on the whole, I do not claim for it that the effluent is by any means clear, it is not offensive. The tank has never been touched during the last eight years, and the last time I examined the drains they were quite clear, and no solid matter had ever passed out of the chamber, showing that the solids had been broken down and anticipated. Since then I have advocated its use at my lectures on sanitation, and other tanks have been installed from the advice I gave, so that no patent rights can be claimed for this portion of the arrangements which are now before the public. It has always seemed to me that some precautions should be taken against freezing in an installation of this nature. I have heard of one "Automatic Scavenger" Moun's name for the liquefying tank being frozen up; it would be very inconvenient indeed if such should be the fate of some erected by our members; this is one of the points to be thought out.

EARTH-CLOSETS.

I do not suppose any paper on the sanitation of a country house would be complete without some remarks on the dry system. A properly constructed and arranged earth-closet is a most sanitary adjunct to a country house, and it is what class it may be intended for. Everything good in this world requires attention, and because the earth-closet requires, perhaps, a little more attention than people care to bestow upon it, it has got into bad repute. I speak now of outdoor earth-closets, and say little about indoor ones. In each country house was provided with an earth-closet constructed on the lines advocated by Dr. Poore, in his books, "*Rural Hygiene*" and "*The Dwelling-House*," some of the difficulties of sanitation would be got over and some of the dangers from the want of it would never arise. I refer to the "dry catch" system, the principle of which is that the floor on which the excreta falls slopes towards the outside, allowing the urine to run into a receptacle filled with mould, and so the excreta is left dry, in which state objectionable gases are not generated. The usefulness of this system depends upon regular attention—I do not say daily, but it is intended to be at first, but regular. The difficulty is in getting people who will go just a little out of their usual course to obtain what will, no doubt, have beneficial results, the latter being to the people concerned not quite apparent. I can only commend to your attention the books of Dr. Poore, as you ought to know something of this method, even if your clients cannot be brought to adopt the system advocated. I also suggest for your personal article in *Country Life*, in the number July 6, 1901, called "An Experiment in Sanitation," written by Dr. Poore, which deals in a most admirable way with the subject of rain-water, and the disposal of slop-water and excreta, suitable for cottages. I have tried to bring before you some points which are usually admitted as essential to the sanitation of a country, or, indeed, any house, but which I find require a great amount of supervision to insure their being done properly, and as the very essence of sanitation is thoroughness in every small detail, I commend it to your most careful consideration, with the final remark that one of our objects should be to try and obtain "The most perfect state of body and mind during as long a period as is consistent with the laws of life." In other words, to render growth and life to decay less rapid, life more vigorous, death more remote.

Mr. THOMAS BLANSHIE proposed a hearty vote of thanks to Mr. Max Clarke for his concise and suggestive lecture. The work of laying drains was being more honestly conducted now than formerly, because architects and clients too, now knew more clearly what they wanted. Personally he had not had a wooden floor laid in a basement for twenty years past. His method was to have a layer of concrete laid, on which was a face of coke-breeze, and the boards were nailed directly on to this, thus preventing the entry of rats, blackbeetles, and even ground air. The boards should not be too thick, and should be treated by the Burntising or Kyanising process. Dry-rot generally occurred in upper floors where the boards were laid too soon, and were sealed by pugging. In cases of dry-rot he had adopted the plan of scraping off the rotten-like surface, and then Kyanising or Burntising the wood, using the solution as strong as possible, and applying it to both bricks and timber. No space ought to exist under the floors, and air-bricks were useless, for so soon as tenants noticed the holes they would block them up; they did not get clogged up by dust. There were always overhanging so as to preclude the protection of rain under the flashing of roofs, and so destroy wall-papers and ceilings. There was great difficulty in disposing of sewage from country houses, for rural councils prohibited its discharge into ditches, and if it ran over meadows it was said to produce abortion among cows. Country cottages should have neither drains nor sinks. Every kind of slop produced in an ordinary rural cottage, including the contents of earth-closets, should be put into the garden. There ought to be some wide-spread confidence in the purifying effect of air. The ordinary soil of a garden, if it might as well be marbles, for all its absorbent powers, and ashes were an abomination. The material should not be dry earth, nor should the excreta be more than barely covered.

Mr. PERCIVAL GORDON SMITH seconded the vote of thanks, remarking that he had come to



MESSRS. GOODALL, LAMB, AND HEIGHWAY'S NEW PREMISES.

NEW PREMISES FOR MESSRS. GOODALL, LAMB, AND HEIGHWAY.

THIS building has been recently completed for the occupation of Messrs. Goodall, Lamb, and Heighway, cabinetmakers and decorators, in King-street, Manchester, one of the principal business-streets of the city, and occupies the site of the old premises in which the business of Messrs. Goodall's firm had been carried on since 1827. The style adopted is in harmony with the nature of the business for which the building was erected, being an adaptation to modern uses of the timber-framed architecture of the seventeenth century. The frontage is entirely constructed of European oak, solidly framed and pinned with oak pegs; the pilasters and other ornamental features being carved in the solid wood. The timber framing is filled in and backed up with wickwork, as required by the local authorities. The panels between the framing are faced with cement, and painted white. Internally the building consists of one large room on each floor; a sub-basement, for packing purposes; basement and five floors above ground devoted to show-room purposes. A goods lift is provided in the rear of the premises, and a passenger-lift gives access to all floors. Round this lift is formed the principal staircase, of dark oak, in character with the general design. The interior generally is handsomely treated in fibrous plaster. The ornamental plasterwork and decorations are by Messrs. Goodall, Lamb, and Heighway. The general contract has been carried out by Messrs. W. A. Peters and Sons, of Rochdale, under the

supervision of the architects, Messrs. Maxwell and Tuke, of Manchester.

In connection with their new premises, it is interesting to note the steady growth of the present business, which was founded 74 years ago by Mr. Edward Goodall, who retired in 1859, having built up a very considerable business which had involved rebuilding and extension of the premises both in King-street and Police-street. On his retirement Mr. R. M. Esplin entered the firm, and under his able management the business continued to develop, and in 1888 was formed into a limited company, and eventually in 1898 was amalgamated with the old established firm of Heighway and Son, painters and decorators, and the firm of Mr. James Lamb, one of the most eminent cabinetmakers in the North of England, the combined firms assuming the title of Goodall, Lamb, and Heighway, Ltd. The present premises, as previously mentioned, consist of five floors, which are utilised to their utmost capacity; the top floor is set apart for library and office furniture, the second and third floors to bedroom and drawing-room suites, the first floor to carpets, and the ground floor to massive sideboards, a variety of rich furniture and furnishing fabrics, and the decoration department, for which the firm enjoys a high reputation, while the basement is devoted to grates, mantels, and tiles. The workshops of the firm are in Cobden-street, Lower Broughton, where about 200 hands are employed in the cabinetmaking, carving, upholstery, and polishing rooms, and the manufacture of parquet flooring. A special feature of the business, however,

is the striking collection of art furniture made from Nelson's old ship, the *Foudroyant*, which was purchased by Messrs. Goodall, Lamb, and Heighway after being wrecked at Blackpool, examples of which we have but recently illustrated. The interior of the premises which we illustrate to-day shows the first of the main staircase which runs from the top to the bottom of the building, and is an exact copy of the Jacobean staircase at Chetham College, and was arranged by Messrs. Maxwell and Tuke, while the ceiling of the ground floor is an exact reproduction of the hall-room ceiling of Haddon Hall.

"BUILDING NEWS" DESIGNING CLUB
A FARMHOUSE.

NO flourish of trumpets is needed to herald the opening work of the Building News Designing Club for the new session. Nothing succeeds like success, and if we may judge by the large number of designs sent in from all parts of the country, it is evident that our Club is more popular than ever. Competition is more keen every day, and it is clear that those who wish to make headway, particularly as architects, cannot afford to ignore any opportunity to improve their knowledge of design, and capability as planners. It is a healthy sign when so many have realised this fact by joining in our Designing Club competitions with so much thoroughness and unsparring labour. The reverse of the circumstance, of course, is that all cannot come out at the top, or even rank as first class. Commonplace and self-evident as this truism is, we have mentioned it in case some of the competitors should feel disappointed, and fancy it is no use trying against such odds. In the natural course of things, several ambitious contributors commence with some enthusiasm, and with a light heart start the session; but so soon as a subject a little out-of-the-way is set, requiring some degree of special study, half-heartedness begins to assert itself, and the number of designs drop in a very unfortunate manner till a more or less ordinary problem is presented. The only object of these preliminary remarks is directed to induce some who might otherwise give in to stick to the subjects, and make the best of them. We cannot hope that all will take heed; but if only a few persevere and act upon this well-worn, but none the less timely, advice they will personally reap the advantage presently.

The following were the instructions issued for the guidance of competitors:—A country-side Farmhouse and Inclosed Garden, with Summer-house in the corner. Site near the main road and some distance from the farm buildings. The accommodation to comprise a large living-room hall 28ft. long by 17ft. wide, and an angle-nook fireplace on one long side of the room. Entrance to be by way of lobby or vestibule, so as to divide external door from this apartment, out of which the staircase is to lead with a good half-space landing suitable for one or two pieces of old furniture, and leading into a mezzanine writing-room about 12ft. square. A parlour is to open out of the living-room hall and have a door out of the entrance vestibule for direct access to the front entrance there is to be a good porch with a doorway out of it into a gun-room or smoking-room about 12ft. square. The kitchen is to be about 20ft. by 15ft., with scullery, wash-house, bakehouse, milk dairy, good larder, pantry, and store place. For enclosed yard in connection with offices to have a covered way on one side. Servants' w.c. in yard and a cycle-house to be provided outside. There are to be six bedrooms on the first floor, and two more with fruit store and box-room, in the roof. The site slopes from N. to S. one in eight. House to face south on garden front, and to be entered from the east or roadway side, where the gate is to be in garden-wall, which will inclose an area 40ft. long from front of house, and as wide as the garden front, besides 12ft. extra on the east side, so that the entrance front will be 12ft. set back from road. The porch may form part of the wall. The style of the building is to be suitable for stone country with stone slab stairs. The first floor and upper walls to be rough-cast; chimney-stacks in brick. Windows to principal rooms on ground floor to have plain mullions and metal casements. Woodwork externally to be oak. A feature to be made of the setting out of the informal garden, which may be shown to a small

to be seen. Seek for the house plans (in, to the fact. Sufficient drawings to show the design, which must be suitable and more or less detailed. Viewed from an account of space."

Mr. J. failed in the first competition because they forget that a farmhouse is not a villa, or a retired professional man's rural abode, or a country mansion, or a sort of seaside boarding establishment. Farmers' ways have, to some extent, changed, and "culture," to use a catch phrase, comes in more, however, as a *mode*, with something substantially as the Japanese fan craze, which still lingers in a tattered way in the more outlying holdings of remote parts. The farmer is the farmer still, and he wants a house adapted to his habits and life. There is no reason why he should not enjoy an artistic home, and it cannot be really that unobtainable, but it must be made practical. A more deflection of quaintness, and a straining after the picturesque cannot count as a success. The effort is too prominent. The designs which we have selected from the vast number of plans before us are the best of the whole lot bearing these conditions in mind. We cannot describe either one of them as ideal, and it is easy enough to find fault. We have not failed to observe these, and we have noted too the merits of others. Still these are the best, and this is their order of merit: "Uno" first, "Ko-ping" second, and "Pete" third. We think that "Uno's" design is a little too ambitious for a farmhouse, and that "Ko-ping" in this respect is the better of the two; but, taking everything into consideration, these two we have in giving our decision. The reader can form his own opinion by comparing the plans. "Uno's" house would look very well in execution, subject to a few improvements, such as the strengthening of the angle pier of the porch, and omitting the ugly spiky buttresses. The plan is compact, and the kitchen part is shut off without too much disconnection. The dining-room does not open out of the porch, and the parlour does not open out of the living-room hall. We have taken these points into consideration. We do not quite like the way arrangement on either floor. The difference in the fall of the land is hardly shown to be provided for on the plan so as to get the cycle-hoof way to the porch on both sides; but that could be managed. The design of the first-floor corridor rather overweights the total area for good planning, and when one takes into account the staircase space, the passage area may be described as wasteful for a house of the size. The garden scheme is not very satisfactory, and the summer-house not very attractive. The author will improve, and with his good taste to adopt a reasonable and effective simple style. The south front is a little over-windowed. "Ko-ping" is not so ambitious, and the cottage-like type followed is unassuming. The plan is not so well thought out. For example, there is really no proper fireproof shown in the hall living-room, though we see an open basket grate is intended, and we think it would be most objectionable in so disagreeable a place, between the two doors. The way under the stairs is not nice, and would be low as it is. The dark passage between the kitchen and the living-room is bad. We asked for a large landing, and here it is needlessly spacious; but the dressing cupboard is a nice cupboard, and the bedrooms for the most part are a good shape. The second staircase in such a house is really not necessary. The backhouse has got a small little oven. The cycle-house should have been reached from the outside by preference. There is no place for the dustbin save near the back-house door. A view in both these cases would have been an advantage. The drawings, however, speak for themselves.

"Uno's" house is stylish and good, marked by some detail, but the building assumes more of an English gentleman's home rather than the character of a farmhouse. The area devoted to the garden is somewhat excessive without obtaining that sense of prominence which so much of the best design is sought to insure. The vestibule is a mere, and the stairs at it are unattractive. The house is in too poor a position: if located where the ground is as it would have been more out of the way and quite as handy. The kitchen is not adapted enough for a residence of this type, but it is too good for a farmhouse, where the living-room and dining-room should be convenient. The garden and the stairs are not well worked out. The house, however, is practically open out of the living-room. The bedrooms are poor. The floors are better, though the coal-pile is

much too small. The summer-house is hardly a success, and the garden plot is most ordinary. "Ich Dien" is far too romantic and odd to be ever successful unless he becomes more serious, paying more regard to the essentials of good draughtsmanship and ordinary building construction. It is a pity he tries so with mere fancifulities, making a toy-like house and doing things which a little thought would have avoided. We place him in this position because he shows a fine sense of fitness in his plan, and an unconventional originality which, with a little more taste, would have resulted in a far better design. The w.c. door next to the front entrance is a radical defect; the freeland lines throughout are foolish, and the liberty taken with the roofing in the perspective is deceptive; the summer-house is like a piece of tin. "Jack" does not realise a farmhouse, and is more ordinary, which, however, in some ways is an advantage. He sends a picturesque design, but his angle-nook recess to the living-room would not come on the site. The vestibule is practically an inner hall, out of which the staircase rises. The landing is wasteful, and not particularly well adapted for the display of old furniture. "Pete" has a fine elevation which fails to express his plan nicely; but we like the stairs going up out of the living-room hall. Upstairs, he gets muddled and characterless, as well as wasteful. Wide steps and narrow steps, round and up and in. "Parnisse" gives an octagonal gun-room, and writing-room over. He lacks a sense of fitness in his plan, and the drawing-room is right on to the fire-escape. The verandah is meaningless, as you cannot reach it from the room, and it is in too public a position near the front door. The best part of "Parnisse's" work is in the south elevation, and even here the ground-floor bay is too fussy to be pleasing. "Black Swan" is a fine plan, and in the elevations, which he draws to suit the style. His plan is very interesting, and lacks idea. The step in front of the canted door to the dining-room hall and out of it into the parlour is another fault introduced without rhyme or reason. "The Bard's" plan is much more compact, and more suited for a farmer. In style it is better than the "Yorkshire" plan. The long, flat gable line over "The Bard's" porch or loggia is ugly in the extreme, coming off almost to nothing, and being finished in rough-cast; the angle-column over-emphasises a trifle the disguised construction. "Young Craftsman" really ought to do better. His house looks like a spring, though the pointed arch to the porch is a fine touch. The plan is a little cramped, and use of the opening to its narrow centre. The perspective forced in between the other drawings is badly done. The author curses his ink, in a note on the sheet, and speaks of his work as "finicking," an expression which befits it. All the same, there is an amount of style and idea about "Young Craftsman's" work which makes it seem as if he had not done himself justice. "Nocte" sends a house far more like a farm; but we cannot like his south front. The gallery round three sides of the living-room hall does not enhance its comfort. The free and easy character of the plan for the purpose is commendable. The majority of the small, narrow, and the staircase does not lead to them in a particularly direct manner, seeing that you must pass along the living-room gallery every visit you make to the upper part of the house or adjourn to the w.c.

"Ary" has his good points, but the house generally is odd and not convenient, being schemed without much regard to the working of a farm. The milk-store, bakehouse, and the rest are like cubicles off a corridor. "Kom-ill-o" sends a fine villa-like house compact enough, but too cramped for the farmer. The farmer who would kick his shins against the projecting hearth and steps and stairs in the narrow entrance vestibule. "Grip," from an external look at his house, is one of the most successful, cottage-like and suitable; but his plan falls badly with the living-room hall cut in for comfort, confusion, and angles, windows, stairs, and fireplace. The ground plan looks all vestibule and water-closet department. "Anne's" plan is far more like a farmhouse with the kitchen and parlour opening out of the living-room, hall, and the vestibule reduced to a minimum. The author only sends one elevation that is neat, but is very much in character. If the author asks what we think of it, we may reply that its features are distributed all about without either

giving the pleasure and distinction of contrast; unpretentious but uninteresting.

The second-class designs we can hardly go into so much, brief as our former notes have necessarily been. "Primus" is too like a villa, and is wanting in good outline. "Rats'" house looks suitable, which is no small praise; but we cannot say its parts in plan show much study. The administrative part is so poor, and the passages are so wasteful. "Penny-nod" has some good points with a quiet kind of elevation, but the verandah and angle-sloped porch do not come together nicely, and roof awkwardly with the wasteful half-landing, and needlessly big staircase hall. The author has worked his scheme out thoroughly and spares no pains. "Nota Bene" makes a pretty-looking kind of villa with a T-shaped living-room, which is a good scheme projects next the angle-nook, the service from kitchen being by way of the stairs, thus accommodating the fall in the site. The contrivance is ingenious and the drawings are well done, save the rough block plan and ugly garden arrangement. "Spil" is more ordinary and neat, with a nicely set-out formal garden, and a good elevation. "Parnisse" is a success, and the house plan is too involved to be good. "Aecia's" design is suitable outside, though not attractively drawn. The bay to the living-room is very commonplace. The plan is original, but the through-way passage between its two parts seems wasteful, and the staircase is quite dark. "Uno-Pon" has a restless look, and spoils his plan by the crowding of the stairs from the kitchen through the pantry into the living-room; otherwise the author has a far nearer idea of a farmhouse plan than some others. The segmental bay and raking buttresses do not admire. "Jove" puts a squat tower with a domed roof over his porch, and makes a rambling plan with many small rooms, and a verandah with some success to adapt it to the fall of the ground. The design lacks repose. "Kraap," too, is restless, drawing heavily, with wriggling, tower-like cracks all over the roof slopes. His garden front is pretty, and he has a notion of the picturesque; but the chimney-stack over the ingle comes badly in the roof. "Grondle" prints badly in a production with many small rooms, and a verandah compact, but the living-room is encumbered by the stairs, with the well-hole above in its ceiling. "Triangle" draws in a coarse way, and lines-in parts of the roof inside a broken line, leaving the rest white as if the slates had been stripped. He gives no elevation of the long wing tacked on to his square house. "P'ing-P'ing" is too ambitious, and puts his house in a wrong round on the land, which is a mere detail. He acknowledges his mistake. Let him draw in a less casual style. The features of the design and the lines with which it is shown seem to come all over in an accidental fashion, ignoring all idea of breadth. "Celt" scores his rubble-stone walling all over to give the effect of flint. The cushioned seats in the ingle nooks and bays make a feature in the plan. The parlour is nearly as large as the living-room.

"Tentavi" lacks style, and should give up the wide segmental-headed windows, which disfigure his façades. "Brum" shows a compact plan, the bedrooms being divided by a long corridor. The elevations do not offend, but they fail to inspire. At least, they show that "Brum" will go to bed at bedtime. "D'Aria's" scheme does not emphasise any feature in the plan, as all gables should be effective, and not look stuck on just as mere fancy dictates. If this one idea is realised, the author will at least have learned one lesson from this criticism. Space precludes more. "Joco" works seriously, but his plan looks bald, and his vestibule dark, with the small square window, though the window above to the stairs is over-big.

"Scotia" at great pains shows odd quaintness in the fittings seen in the section; but they are ugly, and the door-panels, if novel, are no improvement. Drop such fancies, and study straightforward simplicity, and when you plan a room remember its use. The parlour and bedroom over it are miserable little things. "Carlton" has very bravely shown a mere few courses of brickwork over the ridge line. The bays out of the living-room, with their angle buttresses we must condemn. Your back elevation is the best. Try to realise why we tell you this. "Jack," avoid a change of roof-pitch when you can. See how ugly and so porch-roof looks in your garden and verandah. And here is your lesson: work out how the roof

of this steep pitch would mix with the less than 45° eadent at the four entrance front. "Lancaster" makes his house look too much like a pair of villas; but his plan is good in several items, such as the service from the kitchen, and the economy of passageway without a loss of roominess in the entrance; though the front door would have been better in a line with the rest of the front and the "Lancaster" will expect improved work later on. "Koh-i-Noor" sends two perspectives besides the required drawings, all on one sheet. His plan is not so compact, with a big wide passage through the house on both floors. The living-room itself is on two levels. The elevations are too crowded with unnecessary detail. "Cross Cop" is compact and plain; but the shored-up effect of his ramping buttresses is uncouth, and his drawing is poor. The plan has distinct merits for its purpose. "Ingle Neuk" comes next, and "Romulus" finishes the second-class series with an unfinished drawing.

The following may be reckoned among those who rank third as a class:—"Gipsy" (with a circular summer-house which, so far as that goes, is one of the best sent in), "Dhoom," "Chick" (with a good front elevation), "Le Roi," "Koko," "Snitch," "Nell Byn," "Edina," "A. J. Labon," "Nihil," "Ten to One," "Inust," "Jag," "Clayton," "Draig Glog," "Clachnacuddin," "Compact," "Wolf," "Jaspia," "Redun," "Torus," "Bruin," "Indian Ink" (this student really ought to do better), "Lethic," "Zecolo," "Black and White," "Mowgli," "Ping Pong" (2 E. L. burch), "Iron," "Fet," "Ting," "Rose," "Phalac," "Ivy," and "Cymru."

PICTURES BY LAMBETH ARTISTS.

THE idea of holding an exhibition of works of art by past Lambeth men and women, proposed by members of the Doulton Institute, has been realised in the interesting loan collection of pictures by past students of the Lambeth School of Art, including works by many eminent painters. The exhibition has been arranged with the assistance of Mr. J. C. L. Sparkes, and is held in the hall of the Doulton Institute, High-street, Lambeth, S.E., and contains several works of old students who have become eminent in various directions. The collection includes the Lambeth School of Art and the Pottery has been of long duration, and the development of art in the district, promoted by the Doulton Pottery, seemed to justify such an experiment as that now made. Many important loans of pictures are to be seen on the walls of the Institute hall. Among these are two finely painted and expressive portrait of His Eminence Cardinal Manning, painted by Walter W. Outless, R.A.; also one of Mr. P. E. M. Westlake: two fine works by Claud (Athorp deceased)—one of them "Attempted Assassination of William the Silent," and "Convalescence," representing an invalid child and nurse preparing tea; slight in handling, and full of sunlight and character; also "In the Viking Age," by W. K. Stevens, a scholarly work, three ambitious works by Herbert A. Bone—one showing a stirring scene of the landing of the Danes off the Pevensey Ledge at Swanage, A.D. 877; another sunset before the Chamber door of the Holy Sepulchre, and two other oil pictures of poetical and full of technical qualities. Two large spirited pictures by Stanley Berkeley, "An Australian Bush Fire" is a vigorous and very powerful piece of realism. In a broad tract of open country covered by bushes a fire is sweeping and burning everything around it; the smoke, fire and smoke horses with their hapless burden of riders and families are dashing wildly through the flames; one horse has stumbled and thrown his rider near a blazing bush. The other picture, "Might is Right," represents a ferocious tiger with its victim, growing at two others of its own tribe which are cowering; a picture showing much technique. The horses in the first picture are very clever in the foreshortening of the fore limbs. We must also notice approvingly some water-colour studies by Miss Helen Phillips of Swiss scenery, "Old New Bridge," &c.; and studies in the same medium from Salisbury, Palermo by W. Rowe; Will Vernon's oil picture entitled "Secrets"—a group of young girls at a casement window, remarkably effective in the sunlight effect and shadow and colour of red blossom. J. W. Godward has a pleasing study of a young girl's face in oil. There is one clever sunlight effect in Arthur E. Pearce's pic-

tures, "The Last Gleam" and "On the Old Quay, Falmouth," and the water-colour sketch of Walter Gandy are of interest. Miss Gertrude Dornham Hammond, whose work is clever and refined, sends a delicate figure composition in water-colour: a young lady in pink Empiric gown seated in a drawing-room, holding a letter and contemplating a full of technical merit, for which a bronze medal was awarded in the Paris Exhibition; also some other studies. Miss C. Dornham Hammond has a clever study of a young lady in oil. Henry E. Stacey has a rugged coast scene, "St. Titilack's Well, Cornwall." Cyrus Johnson sends three feeling sketches, "The Sun Inn, Durham," "The Church in Goshington, Scotland," and a nice sketch by G. Marks. One of the cleverest works of historical genre is "The Escape of the Count of Flanders," by the late Mrs. Catherine A. Sparkes. We also note a clever plan in low relief, "The Annunciation," by John Broad; and works by Geo. Tinworth and Miss Leighton. Several exhibits in the form of half ball workmen of Messrs. Doulton, including some nice stoneware lustre vases by Stevens, a colour-maker, and Baccanalia vase in silicon ware of a rich brown by Hubert Ellis, and a bicycle, mandolin, and electrical machine by A. Parsons; and other specimens of industrial art executed by men engaged in the pottery as hobbies during their leisure hours, are of much interest, and deserve encouragement. We hope the Messrs. Doulton and Co. will repeat the experiment, and hold exhibitions of art in their well-equipped Institute.

BUILDERS' BENEVOLENT INSTITUTION.

THE fifty-fourth annual dinner of the Builders' Benevolent Institution took place at the Hall of the Worshipful Company of Carpenters, Throgmorton-avenue, E.C., on Thursday, the 14th inst. Mr. J. Carmichael, President of the Institution, occupied the chair, and amongst those present were Messrs. H. Fellows, F.R.I.B.A., Mr. J. Howard Colls, Mr. D. Duff, Mr. K. K. Orm, Mr. W. B. Brown, Mr. K. D. Young, Mr. J. H. Brooke Hitching, C.C., Mr. A. Ritchie, C.C., Mr. W. G. Gilbee Scott, F.R.I.B.A., Mr. E. T. Anson, F.R.I.B.A., Mr. H. N. Lancaster, A.R.I.B.A., Mr. J. Gibson, A.R.I.B.A., Mr. H. H. Hare, A.R.I.B.A., Mr. J. Masson, A.R.I.B.A., Mr. J. E. Harrison, Mr. B. P. Ellis, Mr. A. E. Parker, Mr. B. Woodward, Mr. J. Scott Balfour, Mr. H. Holloway, Mr. R. J. Greenwood, Mr. H. H. Barlett, Mr. J. Randall, and Mr. T. Rider. The company numbered altogether about 200.

After the usual loyal and patriotic toasts, the chairman, Mr. Carmichael, in the evening, "Success to the Builders' Benevolent Institution." He pointed out that the object of the charity was to relieve men who had been builders, and in business for at least ten years, whose age must not be less than 55, whose character would bear the strictest scrutiny, and who were now in poverty and want. He had often thought had he been a Carnegie, nothing would have given him greater pleasure than to search for and find out the thousands of poor but honest tradesmen scattered throughout the length and breadth of our land, so that he might help and assist them. He believed there was no more deserving class of men, and none who would more highly appreciate a little financial aid. The cause was a good one, and whilst they were exceedingly grateful for all donations received, he wished to make a special appeal to all London builders to help this deserving charity by becoming regular annual subscribers, and essentially a builders' charity, and ought to be supported by builders. Our merchants did nobly; but he regretted he could not say the same of some of our builders. The annual subscriptions had fallen off considerably this year; but he hoped they would make up the deficiency that night. The funds were administered with the greatest possible care, and at a minimum of cost. It might well be written over the doorway of the committee-room: "No impostors need apply!" In conclusion, he asked the company to remember the words of his fellow-countryman, Thomas Carlyle: "I pass through this world but once; therefore any good thing that I may do, or any kindness that I may show, let me do it now—let me not neglect it, as I shall not pass this way again."

The other toasts were "The Worshipful Company of Carpenters," proposed by Mr. B. J. Greenwood, and responded to by Mr. John Wilson, J.P., the Worshipful Master of the

Carpenters' Company, "The President," proposed by Mr. A. Ritchie, J.P., C.C., and responded to by the Chairman; "The Architects and Surveyors," proposed by Mr. J. Howard Colls, and responded to by Mr. G. H. Fellows, F.R.I.B.A., and Mr. W. Blamfield Brown; and "The Vice-Presidents, Committee, and Stewards," proposed by Mr. H. H. Holloway, and responded to by Mr. E. J. Long.

During the evening the secretary, Major R. A. Bruton, read the list of subscriptions and donations, which amounted to £1,019 3s. 6d. The President's list showed a total of 498 17s. 6d. towards which the President himself had contributed £105.

OBITUARY.

WE regret to announce, in his 81st year, the death of Mr. FREDERICK WILLIAM PORTER, J.P., F.R.I.B.A., of 16, Russell-square, W.C., district surveyor for Holborn and East Strand, Mr. Porter, who died on Tuesday at his residence, Moyle Tower, Hythe, Kent, carried out in earlier years many works in the City, his latest work being the reconstruction of the Sun Fire Office, for which institution he acted as surveyor. He was elected as an Associate of the Royal Institute of British Architects as long ago as 1850, becoming a Fellow and Life Member five years later. He had a seat on the Council some years since, and had read papers before the Institute. He was the senior member of the body of Metropolitan District Surveyors, having been appointed by the Metropolitan Board of Works in 1851. The funeral took place at Hythe yesterday Thursday.

Mr. JONAS B. SPOOK, a well-known architect of New York, died there a few days ago, at the age of eighty-six. Mr. Spook was born in England, but was taken to the United States in infancy. As a boy he was apprenticed to a builder, and started in business as a contractor, but soon devoted himself to designing buildings, instead of executing them. For a time he practised in partnership with the late Mr. Joseph French, but most of his work, for many years, was done under his own name, until he associated his sons with himself, some fourteen years ago. His most important building was the Grand Central Railway Station in Forty-second-street, but he designed also the Metropolitan Hotel, the Hoffman Hotel, the Church of the Angels in New York, and the Tucker Institute and Hebrew Orphan Asylum in Brooklyn.

CHIPS.

The town council of Campton, N.B., have decided to proceed with the erection of an infectious diseases' hospital, on the site of the late Mr. Clifford's hospital. The total amount of the lowest tender is £5,019. The building will be faced with stone, and will provide not only for Campton, but also for the Kintyre district of Argyshire.

The School Board for Edinburgh adopted, on Monday, report by the school management committee stating that they had under consideration the question of the appointment of an architect and superintendent of works, in room of the late Mr. Robert Wilson. It was agreed to recommend that the same person should hold both appointments, as in the case of the late Mr. Wilson, and also that he be paid at the same rate of commission and salary as the late Mr. Wilson. It was likewise agreed to recommend that the board should advertise for candidates.

The memorial-stone of a new Congregational church was laid on Saturday at the junction of Lidgett Park and Shaftesbury-avenue, Roundhay, Leeds. It is proposed to build first a hall suitable for worship, and afterwards, as the need rises, to erect a church. The cost of the hall and furnishings, it is estimated, will be about £2,000. The building, which is to be in the Perpendicular style, will consist of a hall (to seat 280), a classroom, a vestry, with kitchen and other rooms. The full scheme extends to a church (to seat 380), with tower, which will be erected on the south side of the church hall. The work is being carried out under the superintendence of Mr. W. H. Bevers, A.R.I.B.A., Leeds.

An English-American syndicate has applied to the London County Council for a 99 years' lease of a site on the north side of the Strand, between the two points at which the new street from Holborn will debouch on the Strand, and which to erect an office building on American lines, at an estimated cost of £200,000. The building will be seven stories in height—a portion of it rising three stories higher—with a base of 750 ft., and will contain more than 6,000 rooms.

PROFESSIONAL AND TRADE SOCIETIES.

THE BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.—The last-mentioned meeting, 1901-2, will be held at the Grosvenor Hotel, Grosvenor Gardens, Burlington House, W., by kind permission of the president and council of that body, on Saturday, Dec. 7, 1901, when the chair will be taken at 10.0 a.m. The minutes of the last general meeting, held at Birkenhead, July, 1901, will be read and put for confirmation. Ballots will be taken for the council and officers for 1902-3, and for new members and associates. Discussion on Mr. Ingham's paper, entitled, "The Design, Construction, and Test of Open and Covered Service Reservoirs" (paper read at the annual general meeting, July, 1901). Reading of paper entitled "French Practice in the Manufacture of Cast-Iron Pipes," by A. G. Jenke. Reading of paper entitled "English Practice in the Manufacture of Cast-Iron Pipes," by S. H. Terry, M.Inst.C.E. An abstract entitled "American Practice in the Manufacture of Cast-Iron Pipes" (from the *Engineer*) will be taken for reading. Discussion will be invited on these three papers.

LIVERPOOL ARCHITECTURAL SOCIETY.—The first of the new series of lectures, known as the "modern" meetings of the Liverpool Architectural Society was held in the Free Library, William Brown-street, on Monday evening, when a special greeting was offered to the students by the Chief Librarian of the corporation, Mr. Peter Cowell. The institution is singularly rich in its collection of books bearing on architectural subjects, and many of these treasures were opened out at the instance of Mr. Cowell to the examination of the aspirants after distinction in the art to which they have devoted themselves. Mr. Cowell was accorded thanks in acknowledgment of the privileges which he had extended to the members of the society, the secretaries of which are Mr. Haswell Grayson and Mr. Gilbert Fraser.

MANCHESTER SOCIETY OF ARCHITECTS.—At the monthly meeting, on the 14th inst., Mr. Durbach in the chair, there was an exhibition of students' drawings, and the following prize-winners were announced:—Design for a small village bath, Mr. Gerald Salomons; for the sketches in connection with the summer visits, Mr. Frank Osler, 2nd; Mr. Gerald Salomons, for measured drawings, Mr. Charles Paterson, 2nd; Mr. Gerald Salomons. Afterwards Mr. Paul Waterhouse read a paper entitled "Architecture Among the Modern Arts." Mr. Waterhouse took it to be an axiom that the greatest periods of historic art had been those in which there was no consciousness of art; that, in fact, consciousness in art was a danger to its existence. He contended that when we were looking upon the modern practice of analysing the very nature of art as a necessary means to art powers of art production. Our age was, above all, an age of expression, and in architecture especially the powers which made the critic seem, he thought, allied to those which made the producer. In fact, the very technical exercises that enabled us in these days to detect and detect that essence of art which was unnameable to our forefathers were not necessarily destructive of creative skill, but might be turned—at least, so far as architecture was concerned into the instrument of a finer, fuller, and more intellectual creation. After speaking of the simplicity which underlay Greek art, the beauty of some of the best specimens of Roman architecture, and the buildings of the Italian Renaissance, which, last, he said, breathed the sense of art, the speaker emphasised the fact that art as we understood the word was never talked about by their builders. In the great Gothic days the mason was a skilled craftsman who was imbued with the simple faith in his work which was to him an expression of pious faith and Christian belief; but the mason would have been quite unable to talk about his work. Until the present age art was cherished and beloved, but never talked of. We had, however, to-day, and, sometimes the ability, to express changes which a former age would never have attempted to handle. Every young man had a sense of architecture of his own. Today an uneducated mason was expressed, but all noble work had its traditions in recognised styles, and we were not the result of an academic choice. No architect to-day could consider himself equipped for his work without a sound knowledge

of the elements in which he worked. So far from being called a common-sense, by deeper insight, the architect must necessarily be a student. He attained the highest possible to him only when he could criticise his own work in the light of knowledge. Architecture was, so speak, the application of knowledge to construction, therefore only the man of wide knowledge could be trusted to judge or modify the old rules, since his power to judge depended upon his knowledge of the work of his predecessors. Architecture was creative, and arose from the divine in a man. As its name implied, it was the queen of crafts; the architect was not an initiator, but a creator.

NORTHERN ARCHITECTURAL ASSOCIATION.—The opening meeting of the winter session of this association was held on Friday night, at the rooms, Northumberland-street, Newcastle-on-Tyne, the president, Mr. Frank A. W. F.R.I.B.A., in the chair. The secretary (Mr. C. B. Plummer) read a letter received from Mr. William Glover, the ex-president, tendering his resignation of membership on account of ill-health, which had necessitated his removal to a more southern climate. The president, in his inaugural address, said that the nineteenth century would be distinguished by the future architectural historian as the most fickle hundred years of all, in regard to the number, variety, and incompatibility of the styles and fashions of buildings, which it had so restlessly and inconstantly first embraced and then spurned. During this period the battle of styles had been fought, and the result was a final issue, but to the finish of the two contestants, the old Classical and the resuscitated Gothic, neither of which had survived; "Dead as Queen Anne" was an old saying; but if any distinguishing feature survived to the twentieth century, it was the Queen Anne style, which seemed to enjoy the prospect of extending its influence far into the future. But it was a style, not a use arguing for and against a style. They were all deeply influenced by one another. The intercommunication of nation with nation had, during the twentieth century, by its international exhibitions and in a thousand other ways, been developed to an extent undreamt of in old-world days, and powerfully tended to the exchange, assimilation, and commingling of racial ideas and influences, not only in architecture, but also in manners, dress and literature. The twentieth century would advance perhaps half its length before the ordinary observer of British architecture would become impressed by some resultant style, as the eventual outcome of that multitudinous clash of styles and ideas, out of which the twentieth century order of architecture could be evolved only by slow degrees. Many were disposed to revert to sweet homeliness. The question was, Would the Gothic again be revived? Architectural as well as literary sentiment was decidedly post-Medieval. However much they were, they had been enamoured of the Medieval in their youth, they must mournfully admit that it was an overblown rose, whose lovely odours lingered still in the cathedral cloisters and old-world haunts, but whose roots found no proper food in the soil of 20th-century ideals. The spirit of art was torn and distracted this way and that between the rival styles, widely different, yet each having its charm and its own hard to resist. The spirit of art wandered restlessly to dry places, seeking some new form, and thus far finding none, or at least none other than the Dutch Renaissance lumber, whereby the fair ground of England was being day by day increasingly encumbered. After forty years in the profession, the fondness for mere fickle fashion yet came, which he rejoiced to discover and to follow whenever and wherever he could. While fashions changed, principles were unchangeable. If they failed to keep pace with fashions, they might ever keep in close touch with those great verities wherein beauty and truth were vitally rooted. Signs were not wanting that the rising generation of architects, to whom the 20th century was looking, were coming to regard an intimate acquaintance with structural principles as a condition of professional proficiency. The president proceeded to speak of education with regard to art, science, and commerce, and he very heartily condemned the practice of receiving

secret commissions, which engendered suspicion and tended to lower the moral status of their profession, and to do it harm to an extent unknown and incalculable.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of this society was held on the 14th inst. in the society's new rooms, Leopold-street, Mr. P. Marshall occupying the chair. Mr. Charles F. Brindley of the firm of Brindley and Foster then gave a lecture on "Organ Chambers and Organ Cases." He said the placing of an organ in either a concert-room, place of worship, or a private house, so as to combine to the fullest possible extent musical, artistic, and utilitarian principles presents many difficulties. The organ might well be described as the most complex of complicated machines, the building of it necessitating an intimate knowledge of mechanics and science, and musical taste and culture must be present in a marked degree. He intended, however, only to deal with the considerations of placing and enclosing instruments, which vitally concerned the work of architects. Dealing first with the placing of organs, he said that the best position for the organ was the far end of the orchestra. In providing for machinery for blowing, care must be taken that (a) the room be dry, (b) within reasonable distance of the organ proper, (c) the temperature be the same as that of the hall. In placing organs in places of worship, not the least difficulty was the unreasonableness in some cases of the architect's client, who, although having no acquaintance with architecture, or acoustical, or musical knowledge, ruthlessly ignores the best suggestions, and cuts out those refinements and beauties upon the achievement of which the enhancement of reputation and growth of art have depended. Lack of space allowed and regarded to all proportion, was the greatest evil, of which the architect's client defects out, as you were if you couldn't do it others could. The placing of the organ on a screen dividing the nave from the choir is undoubtedly the best position, but is unfortunately seldom adopted, and is not favoured by modern architects. Putting an organ in the west gallery is highly recommended by many people, is an organ-hall, but not a good place for an organ. If this latter method was necessary, it devolved upon the architect to design such chamber as to mitigate the evil as much as possible by providing plenty of space, making it of sufficient height, and having ample opening into the church for the ingress of sound. Private houses present the greatest difficulties, owing to the invariably small space and arrangements, the introduction of an organ causes. Mr. Brindley then dealt with the casing of organs, and dealt with technicalities in connection therewith of great interest to architects, in order that in their designs everything might be arranged to the enhancement of the effectiveness and appearance of an instrument. With regard to decoration, the great thing was not to decorate pipes so as to spoil their appearance as metal pipes. Inasmuch as front pipes were never made of gold, gilding might be considered somewhat out of place. Spotted metal was subject to rapid tarnishing. The number of stops depends on the price paid and the quality of the builder's work. A first-class built organ has pipes of full size, and of good calibre. In short, a properly-built organ may be from 50 to 60 per cent. heavier in weight than that of an organ of the cheap class. Consequently, a first-class builder requires more room for a given specification than the inferior builder would know what to do with. It was possible to save or save more than 20 per cent. on a given specification for perhaps 20 per cent. less cost than it would cost another firm in materials and workmanship. He therefore urged architects to not unduly limit the organ-space if they desired to safeguard their clients' interests. An organ builder can be of great assistance in the initial stage to an architect by giving him ideas of placing before him those essentials with regard to shapes and measurements, without which the most artistically designed cases cannot be perfect. A discussion followed, and, on the motion of Mr. E. M. Gibbs, seconded by Mr. H. L. Paterson, and supported by Messrs. W. C. Panton and the president, a vote of thanks was accorded to the lecturer.

A Warburton lecture is to be given at Owen's College, Manchester, on Wednesday, December 11, by Mr. Reginald Blomfield, M.A., on "Municipal Bodies and Architecture."

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ILLUSTRATIONS.

NEW PREMISES FOR MESSRS. GOODALL, LAMB, AND HIGHWAY, LIMITED, MANCHESTER. ST. MATTHEW'S SCHOOLS, SALFORD.—PROPOSED GATEWAY AT SPRING GARDENS. FREE LIBRARY, ETC., AT LEAMINGTON.—FREE CHURCH, SLOUGH.—DESIGNS FOR A COUNTRYSEIDE FARMHOUSE.—HALL IN HUNTING BOX, NEW BOWDEN.

Our Illustrations.

NEW PREMISES FOR MESSRS. GOODALL, LAMB, AND HIGHWAY.

(For description see page 687.)

ST. MATTHIAS NEW SCHOOLS, SALFORD.

The design illustrated was chosen in a competition recently held, but has since been somewhat modified and extra accommodation provided. It is proposed to be erected by the Corporation of Salford in place of the present schools, which are to be demolished for street improvements. The site is a difficult one owing to its limited area and extreme irregularity of shape; but this has been satisfactorily dealt with. The key plan shows the arrangement. The school provides for an infants' department on ground floor, and mixed department on first floor, with an accommodation of 224 and 329 respectively, and is estimated to cost about £6,000. The architect is Mr. Benjamin Bowler, of Birmingham.

QUEEN VICTORIA MEMORIAL, ST. JAMES'S PARK, S.W. The Royal Gate which we illustrate to-day was intended to form the grand entrance to the projected processional road leading to Buckingham Palace at the commencement of the Spring-gardens end in Mr. Ernest George's design, of which we gave a bird's eye view last week. The wings provide archways for the ordinary carriage and pedestrian traffic, the main or central opening with its tall and massive metal gates reserved for Royalty. We have more than once referred to this elegant and capable composition as eminently indicative of its architect's artistic charms in picturesque design, and as an example of his skill it is certainly interesting. The idea has the merit of capitalising as in a frontispiece the five ways beyond. Notwithstanding, we think the design hardly befits a triumphal road in memory of our great Queen.

FREE LIBRARY AND ART AND SCIENCE SCHOOL, LEAMINGTON SPA.

The site is open on all sides, with a frontage to Avenue-road; the north front overlooks the Pump-room gardens. The free library is a separate department, occupying the ground floor, with entrance from Avenue-road. The building contains three floors. The rooms for manual instruction, &c., are on the basement floor, classrooms on the ground floor, and the rooms for the art and science department occupy the whole of the first floor. The entrances to the schools are at the sides of the building. The materials used are local red brick and terracotta, and Westmoreland slates. The total cost is about £17,000. The contractor for the work was Mr. E. W. Atkins, and the clerk of works Mr. E. W. Atkins.

both of Leamington. The architect is Mr. J. Mitchell Horsley, of Leeds and Middlesbrough. The drawing illustrated was hung in the Royal Academy Exhibition of this year.

FREE CHURCH AND COTTAGES, SLOUGH.

This church and the adjoining cottages have been recently completed. The materials used for the exterior are brick, stone, and rough-cast. The roofs are covered with green slates. The quantity surveyor was Mr. Geo. Webster, of Westminster, and the architects Messrs. Hall, Cooper, and Davis, of Old Queen-street, Westminster, and Scarborough. Mr. Bernard Sykes did the modelling of the grounds, and Messrs. Clark and Co. the leaded work.

"BUILDING NEWS" DESIGNING CLUB: A FARMHOUSE.

(For description and awards, see page 687.)

HUNTING BOX, NEW BOWDEN.

This sketch shows the hall of the house illustrated by plans and view in our issue for September 20 last. On November 1 we printed a drawing of the staircase. The walls of the hall are white-cast, and the hood projects from the face of the fireplace, which has a slow-combustion pit arrangement and raised hearth in front. Messrs. Coates and Johnson are the architects.

CHIPS.

A conversation was held on Wednesday night at the St. Bride Foundation Institute, Bride-lane, Fleet-street, when a bust was unveiled of Samuel Richardson, the novelist and printer, who did much of his work in the neighbourhood of Salisbury. The bust was the gift of Mr. J. Passmore Edwards, was the work of Mr. G. Frampton, A.R.A.

The Coal Smoke Abatement Society held a meeting on Wednesday at Grosvenor House, Sir W. B. Richmond, and afterwards Lord Robert Cecil, presiding. Resolutions setting forth the evils consequent on the pollution of the air by coal smoke, demanding the strict enforcement of the laws for its prevention, and pleading support to the society, were spoken of by Sir W. B. Richmond, Professor A. H. Church, Sir W. Thistleton-Dyer, Principal Oliver Lodge, and others, and unanimously carried.

At Lincoln on Tuesday two applications for loans were inquired into by an inspector from the Local Government Board, the first being for £3,441 for the purpose of acquiring the Grey Friary and adjoining grounds, for the purposes of a museum and gymnasium, and the second for £1,500 for the rebuilding of the shops on the High Bridge.

The proposal of Sheffield Corporation to borrow £500,000 for the purposes of the electric light underground was the subject of a Local Government inquiry held on Tuesday at the Sheffield Town Hall by Mr. A. A. G. Malet, A.M.I.C.E. The amount includes £238,422 for works, &c., at the new station; a new electric-lighting scheme, £10,500; and the obligations at the present station reached £134,000.

The electric tramways of the Salford Corporation were formally opened by the Mayor on Wednesday. When the system has been completed the total mileage under the control of the Salford Tramways Committee will be 12 miles of single track, and to this should be added 12 miles in the borough of Eccles and the Swinton district, which have been leased to the Salford Corporation. The estimate of the cost was originally £114,753, but this has been largely reduced.

On Monday week a memorial brass to the late Canon Andrew, for thirty-six years vicar of the parish, was unveiled in Tideswell Church by the Bishop of Shrewsbury. The memorial is from the studio of Messrs. Gower and Sons, London. It consists of a recumbent figure of Canon Andrew, robed, resting upon a tomb. It is canopied above, and at the sides are niches bearing the arms of the sees of Lichfield and of Southwell. Beneath is an inscription, mainly from the pen of the Bishop of Derby.

On Tuesday week, at the town-hall, Hanley, Col. A. C. Smith, R.E., attended to hold an inquiry concerning the application to the Local Government Board for sanction to borrow £4,278 for the purchase of land for purposes of street improvement, and £4,000 for sewage-disposal purposes. Mr. J. E. Wilcox, C.E., Birmingham, and Mr. J. Lobley, borough surveyor, gave evidence as to the proposals.

A new relievo has been erected in the parish church of Holme, Hunts. It is a panel of gilt-gesso work in high relief. The two smaller side ones contain figures of kneeling angels; the central panel shows our Lord on the Cross, with the figures of St. John and the Virgin at the foot of the arch.

COMPETITIONS.

HAWK.—The Carnegie Public Library competition award was published in the BUILDING NEWS last week. Mr. John Burnet, of Glasgow, the assessor, reported in favour of the design marked "Quex," and the plan marked with a red star-shaped seal was awarded the second premium of £50, the first premium being £100. We are now informed that the authors of the design designated "Quex" are Messrs. S. D. Ashhead and E. W. Sloper, of Bedford-row, W.C., and that Messrs. Murray and Forrester, of Old Queen-street, Westminster, are the authors of the design placed second. It has not yet been decided whether either of these plans will be adopted or not.

MANCHESTER.—The City Council, on the advice and adjudication of Mr. Thomas Worthington, F.R.I.B.A., of Lombard Chambers, 46, Brown-street, Manchester, the assessor, have awarded the three premiums for the best designs in the recent competition for a new fire station and police station in London-road, Whitworth-street, and Fairfield-street, Manchester. The winners, namely: First premium, £300, to design No. 23, Messrs. Woodhouse and Willoughby, 100, King-street, Manchester, and Mr. John Langham, 9, Albert-square, Manchester, joint architects. Second premium, £200, to design No. 25, Mr. George Watson, architect, 50, Queen-street, Edinburgh. Third premium, £100, to design No. 19, Messrs. Mangnall and Littlewoods, architects, 42, Spring-gardens, Manchester. It is the intention of the Watch Committee of the Corporation to publicly exhibit all the designs (twenty-five in number) in the Town Hall of Manchester between the hours of 10 a.m. and 5 p.m., on the 15th, 26th, 27th, 28th, and 29th November instant.

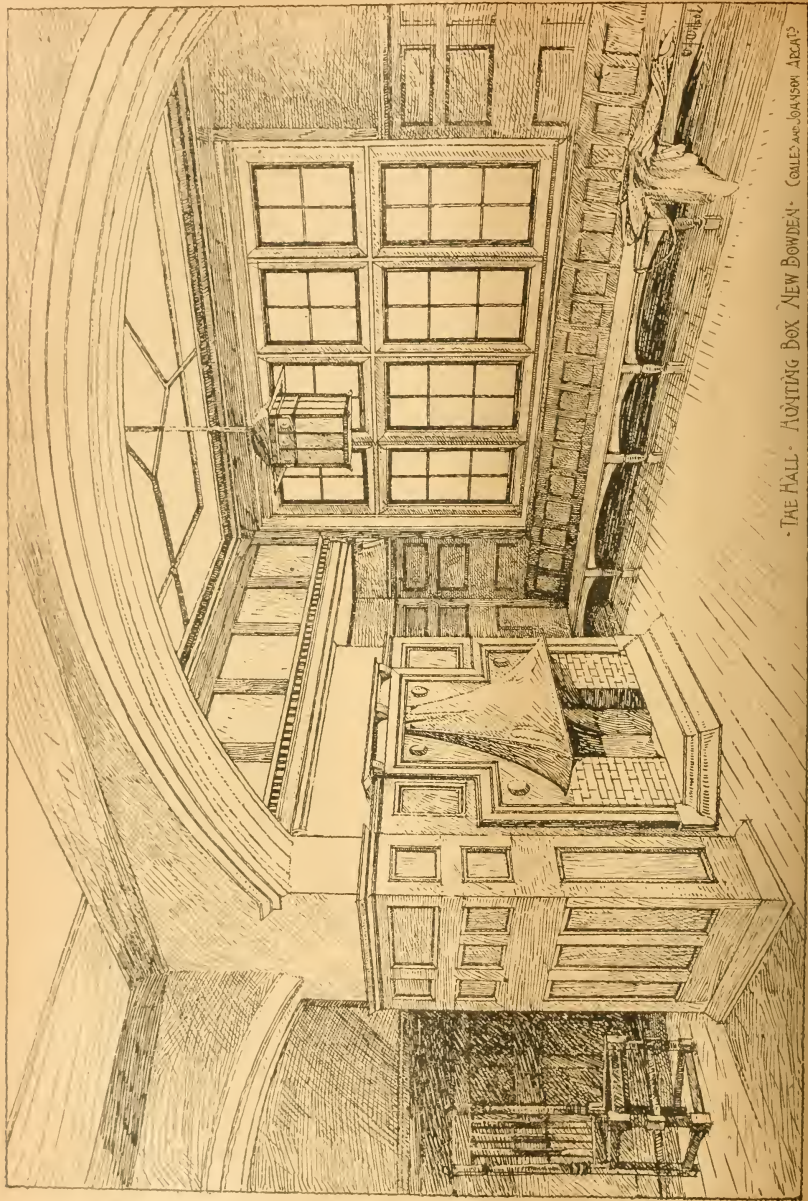
STOCKPORT.—The Municipal Buildings Committee of the town council have received 67 applications from architects for permission to compete in the designs for municipal buildings. This number has been reduced to the following 15:—Briggs and Wolstenholme, Blackburn and Liverpool; Derbyshire and Smith, Manchester; Alfred W. Smith, 1, Janes-gate, G. Gibson, London; Henry Hare, London; William Hill and Sons, Leeds; Holton and Fox, Dewsbury; R. J. Smith, London; S. B. Russell and T. S. Mallow, London; Geoffrey Brady, Stockport; Arthur E. Wilkinson, Stockport; C. R. Locke, Stockport; Stott and Son, Manchester; and Willoughby, Manchester.

Mr. George A. Stewart, late headmaster of the West London School of Art, Great Titchfield-street, W., who had been one of the schools of art at Norwich, Macclesfield, and Eastbourne, died on the 14th inst. at 37, Seaford-road, Eastbourne, aged 74 years.

On Tuesday week Colonel W. R. Slacke, R.E., held an inquiry at the town-hall, Newton Abbot, touching the application of the urban district council to borrow £6,340 for the enlargement of the market and the purchase of properties for that purpose, and £20,000 for the enlargement of the market and the purchase of properties for that purpose, and £20,000 for the enlargement of the market and the purchase of properties for that purpose. It was stated that the free library will be built at a cost of £2,500, presented by Mr. J. Passmore Edwards in memory of his mother, Mr. Silvanus Trevel, P.S.A., of Truro, the architect, produced and explained the plans for the library and institute.

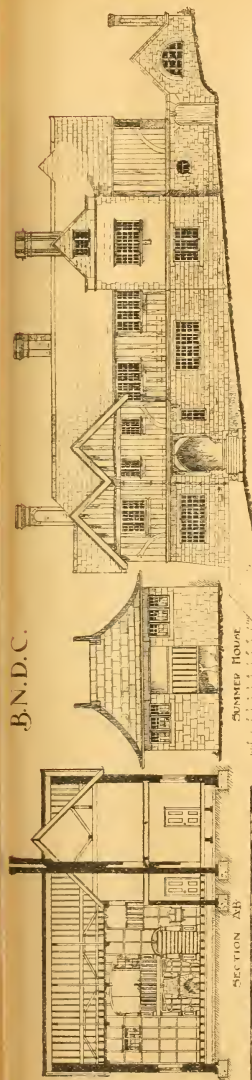
The extensive alterations which are to be made in connection with the Royal Apartments at Epsom Grand Stand will embody an electric passenger lift, the order for which has been entrusted to Archibald Smith and Stevens, Queen's-road, Battersea, and it is interesting to know that the whole of this machine will be of home manufacture.

Mr. E. A. S. Fawcett, representing the Local Government Board, on Thursday, the 14th inst., held an inquiry at Falmouth relative to the application of the town council for sanction to borrow £18,300 for the purpose of sewerage and sewage-disposal. Some time ago the corporation invited from engineers competitive schemes, of which twenty-five were submitted. The first and third premiums went to Mr. Le Maître (Le Maître and Parker, Westminster), whose scheme, at a cost of £1, entered a sea-wall and promenade, 100ft. wide, from Green Bank to the town quay, and also a complete remodelling of the sewerage system. However, the corporation took the least plan, named Gray's, and the plan to which the third premium had been awarded, and which was the subject matter of the application.



THE HALL. LOOMING BOX, NEW BOWDEN'S. COLLIERIES AND LONDON AREAS.

B.N.D.C.



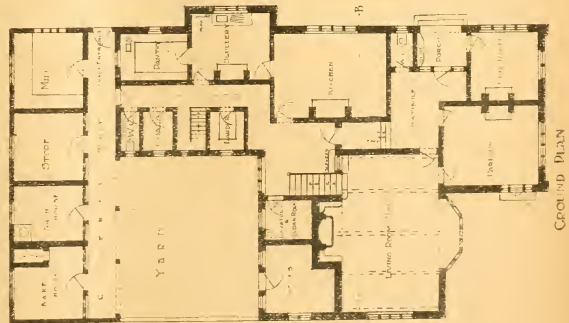
SUNNED HOUSE

with a porch on the west side

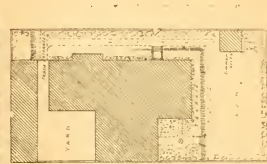
A COUNTRY-SIDE
FARM HOUSE

By PETER

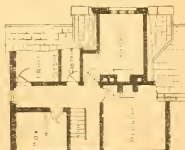
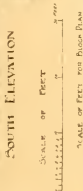
OCTOBER 1901



PLACED THIRD



BLOCK PLAN



ATTIC FLOOR PLAN

The Fitzwilliam Assembly Rooms, Peterborough, have been reopened this week after redecoration and the installation of the electric light. The works were carried out by Mr. E. Ballwell, of Peterborough.

Our Office Table.

The notices sent in by the promoters of railway schemes for consideration to be made to Parliament next session are comparatively few in number, and unambitious in character. The great railway companies are confining themselves to single deviations and widening and extensions of line to carry out works already authorised, and the Metropolitan schemes chiefly relate to small extensions of lines already sanctioned and not yet completed, nor even in many cases begun. Thus a Parliamentary notice has been sent in by the Great Northern and City Railway of its intention to apply in the next session of Parliament for the extension of the railway from Moorgate-street to Tottenham. A more important project is fore-shadowed in a notice issued by the Central London Railway, which seeks sanction for the conversion of the useful and popular "two-penny tube" into a circular route by the construction of an extension from the Bank of England via Liverpool-street to the Cannon-street, and Cannon-street, and then turning westwards via Cannon-street, Ludgate-circle, the Strand, Piccadilly, Hyde Park Corner, Fulham, and Hammersmith, and so completing the circle by orion with the existing tube at Shepherd's Bush. The Piccadilly and City Railway seek authority to follow nearly the same route from Hammersmith where it would cross the United Tramways system to the City, both lines being parallel with the present District line. The Great Northern and Strand Railway Company seek a slight southern extension of the projected line from the authorised terminus in St. Clement Dunes to a junction with the District Railway at Vinton at the Tower, where a new scheme is that of the City and Crystal Palace Railway Company, which proposes to construct a line 7 miles in length from a terminus at the corner of Queen-street and Cannon-street, E.C., via Ry-lane, to the Beckenham-road, Penge, opposite the south-eastern entrance to the Palace grounds. The North-East London Railway will seek powers to make railways from the City to Tottenham and Edmonton in conjunction with the Piccadilly and City scheme, which is organised by the same promoters. The London and Brighton Electric Railway, which we referred to last week, will be fiercely opposed by the Brighton and South Coast Railway Company. Other notices refer to take of land from Victoria to Greenwich, from Barkly to Peckham. The City and South-East London Railway Company are apparently abandoning their authorised scheme for a utilisation of the disused section of the railway from the Monument to Borough High-street in a branch to Brixton Palace-gate, and will endeavour next session to obtain powers for a branch from the Borough High-street to the old station near the Monument.

The London United Tramways Company give notice of their intention to promote a bill for powers to construct an extensive system of new local tramways in the counties of London, Middlesex, and Surrey. The new tramways will pass through Hammersmith, Notting-hill, Huddington, Brixington, St. George's, Hancoversquare, Mortfield, Farnham, Richmond, North Sheen, Coombe, New Malden, Merton, Mitcham, and Wimbledon. So far as the London County Council is concerned, its new Tramway and Improvements Bill, to be introduced into the next session of Parliament, includes an extension of existing tramways through Chelsea, St. George's, and Westminster, and along the Thames Embankment to Blackfriars Bridge.

A very more important proposal coming before Parliament next session, and one affecting all who dwell within the Metropolitan area, is the bill for the Purchase of the Eight London Water Companies to be introduced by the Government. The present companies are to be bought out under a Statute, and a Water Committee is to be appointed, practically representing the London County Council, but in which the City Corporation will be represented. Arrangements are out for the construction of water-supply extension in Metropolitan districts, and for the transfer of waterworks undertakings to county councils and other local authorities. The production of the draft bill will be looked for with interest, as the ratepayers will wish to know whether this proposal will be favourable to the consumers' interests or those of shareholders in existing companies.

"And still they come," naturally occurs to the mind of the reader as he this week observes the announcement of yet another work on the subject of formal gardens, now in preparation, the joint production of the enterprising publisher, the artist, the photographer, and the industrialist. Messrs. Mawson and Milbourn and Messrs. Reginald Blomfield and Inigo Thomas have already covered the ground more or less thoroughly, and now Mr. Inigo Triggs, aided by the co-operation of Mr. R. T. Batsford, and the camera of Mr. Latham, has taken the subject in hand. The idea of the current work is a volume of corresponding scale and character to the folios illustrative of the English Renaissance, published by Messrs. Gough and Talbot Brown and Messrs. Belcher and Macartney. No one who has read the volume can have forgotten Mr. Sedding's poetic book on garden making, which, of the excellent modern editions, English Gardens, issued by Messrs. Newnes and Co., leave little to be desired in a popular sense. Many a specimen of formal gardening incidentally occurs, too, in the photographs of Old English Mansions which enrich the four big books above referred to on the Renaissance in England. Is there room, then for another work? Mr. Batsford, judging from the plates which are shown publicly, and evidently intends that there shall be no doubt whatever about the reply he has anticipated, and while the programme which he has placed before us necessarily includes many old familiar friends, the treatment adopted, speaking from the before-mentioned samples, will present the subject before the reader in a special and certainly in a very charming way. There are to be three parts, at one guinea each, the plates are to number 120, fifty of these being photographs. Reproductions of old engravings are also contemplated. The feature of the book will be chiefly Garden Architecture, with gateways, steps, terraces, balustrades, summerhouses, garden temples, bridges, sandials, columbaries, ponds, topiary work, vases, and fountains. Plans, fully detailed from an architect's standpoint, will be shown to a good scale. Part I. will be ready by the middle of December.

A SERIES of new working rules for mill-sawyers and wood-cutting machinists in the London district has been agreed upon by representatives of the London Master Builders' Association and the Amalgamated Society of Mill-Sawyers and Wood-Cutting Machinists. The working hours in summer will be from 6 a.m. to 5 p.m. for 40 weeks. During twelve weeks of winter, commencing on the second Monday in November, the working hours will be for the first three weeks 47 hours per week, and during the six middle weeks 44 hours per week. Overtime, when worked at the request of employers, but not otherwise, will be paid at the following rates—on Saturdays, leaving off at 10 p.m., and on ordinary rate; from 10 p.m. to 10 p.m., time and a quarter; after 10 p.m., double time. On Saturday the pay for overtime, from noon to 4 p.m., will be time and a half; after 4 p.m., and Sunday, double time. Christmas Day will be paid for the same as Sunday. One hour's notice is to be given or one hour's time be paid by either side on detaching an employee from the scale of wages will commence at noon, or at noon thereafter as practicable, on Saturday. Wages earned after leaving-off time on Friday, and Saturday, only will be kept in hand as lock time. The term "London District" is construed to mean 12 miles radius from Charing Cross. An important addition is a conciliation rule. For the adjustment of all disputes, and in case of stoppage of work, it is agreed that upon a difference arising between an employer or upon the works of an employer and any of his workmen from any cause whatever, notice shall be given by the Association or Society of the complaining party to the Association or party representing the employers, and the subject-matter of dispute shall thereupon be referred to the Board of Conciliation, who shall be summoned within seven days, and, if practicable, shall give their decision within the next six working days. The Board of Conciliation shall consist of three members nominated by the employers and three by the workmen. The number of representatives of the employers and of the workmen on the conciliation Board shall always be equal, and shall be so maintained during the sitting. The Board of Conciliation so constituted, if unable to agree, shall make application to the Board of Trade under the "Conciliation Act, 1896," or apply for the appointment of a person to act as Conciliator.

The Board of Conciliation shall have power to decide all questions arising between the employer and the workmen, including any question between one trade and another as regards the representation of the other matters, provided that for the decision of any question as to claims or rights of other sections of the building trades, a Joint Conciliatory Board shall be constituted of the three representatives nominated by each trade involved, and by a similar number of representatives of employers, so that members on the Joint Conciliation Board may be specially represented on such local questions, and the numbers of representatives of the employers and workmen on such Joint Conciliation Board shall be equal, and be so maintained during the sitting.

An unexpected difficulty has appeared in the construction of the Phoebe-Hearst Buildings at Berkeley, near San Francisco, for the University of California, of which M. E. Bénard is the architect, his design having been selected in the international competition organised eighteen months since. It seems that there was some error in the plan of the architect, for, when the mining building, the first of the series to be constructed, was staked out, it appeared that one corner of the proposed site was 70 ft. higher than the lowest portion. M. Bénard plan of the group of buildings was based on topographical surveys furnished to all the architects, and was long ago accepted by the authorities of the University. It is not stated in detail M. Bénard's selected design in outline of March 30, 1900, and it is satisfactory to learn that it is being put into execution.

No company has been subjected to more criticism than has that known as the Associated Portland Cement Manufacturers' 1900, Limited, and the report of the directors is therefore of interest. The profit, after deductions, which include £132,000 for repairs and renewals amounted, to June 30, to £48,241. Directors' salaries, debenture interest, and other interest, absorbed all but £30,704 of this, which is proposed to carry forward, giving depreciation to go-by for the moment. The very unsatisfactory results are said to be the outcome of the increase in price of coke, the keenness of competition, and the fact that several unprofitable contracts were taken over.

Trade News.

WAGES MOVEMENTS.

THE LABOUR MARKET IN OCTOBER.—The monthly memorandum prepared by the Labour Department is for the third time a report of the movement of employment in October showed no change compared with the previous month, but was not a good as a year ago. It was, however, considerably better than the average state of employment in October during the past ten years. In the 11 trade unions, with an aggregate membership—544,827, making returns, 19,935 (or 3.7 per cent. were reported as unemployed at the end of October as compared with the same percentage in September, and with 3.5 per cent. in the unions from which returns were received for October, 1900. Employment in the building trades has continued to decline. The percentage of unemployed union members among carpenters and plumbers at the end of October was 3.5, compared with 2.2 per cent. in September. The percentage for October, 1900, was 2.5. In the furnishing trades employment is scarce, so good. The percentage of unemployed members at the end of October was 3.6, compared with 2.2 per cent. in September, and 3.1 per cent. in October, 1900. Twenty-six fresh disputes began in October, 1901, involving 10,950 workpeople, of whom 5,488 were directly and 5,462 indirectly affected. The corresponding number of disputes in September was 35, involving 8,654 workpeople, and in October, 1900, 30, involving 16,079 workpeople. Of the thirty new and old disputes, involving 7,210 workpeople, of which the definite result is reported four, involving 1,301 persons, were decided in favour of the employers; sixteen, involving 3,241 persons, in favour of the employers; and ten, involving 2,668 persons, were compromised. The changes in wages reported during October amounted to 17,488 workpeople, and part of the change was an increase averaging 1d. weekly per week.

The rebuilding of the mansion at Welbeck Abbey after the fire will, from all accounts, occupy some years, and part of the strange underground galleries carried out by the late Duke of Portland will probably be demolished. Mr. Ernest George is the architect, and Messrs. Trollope are the builders.

LIST OF COMPETITIONS OPEN.

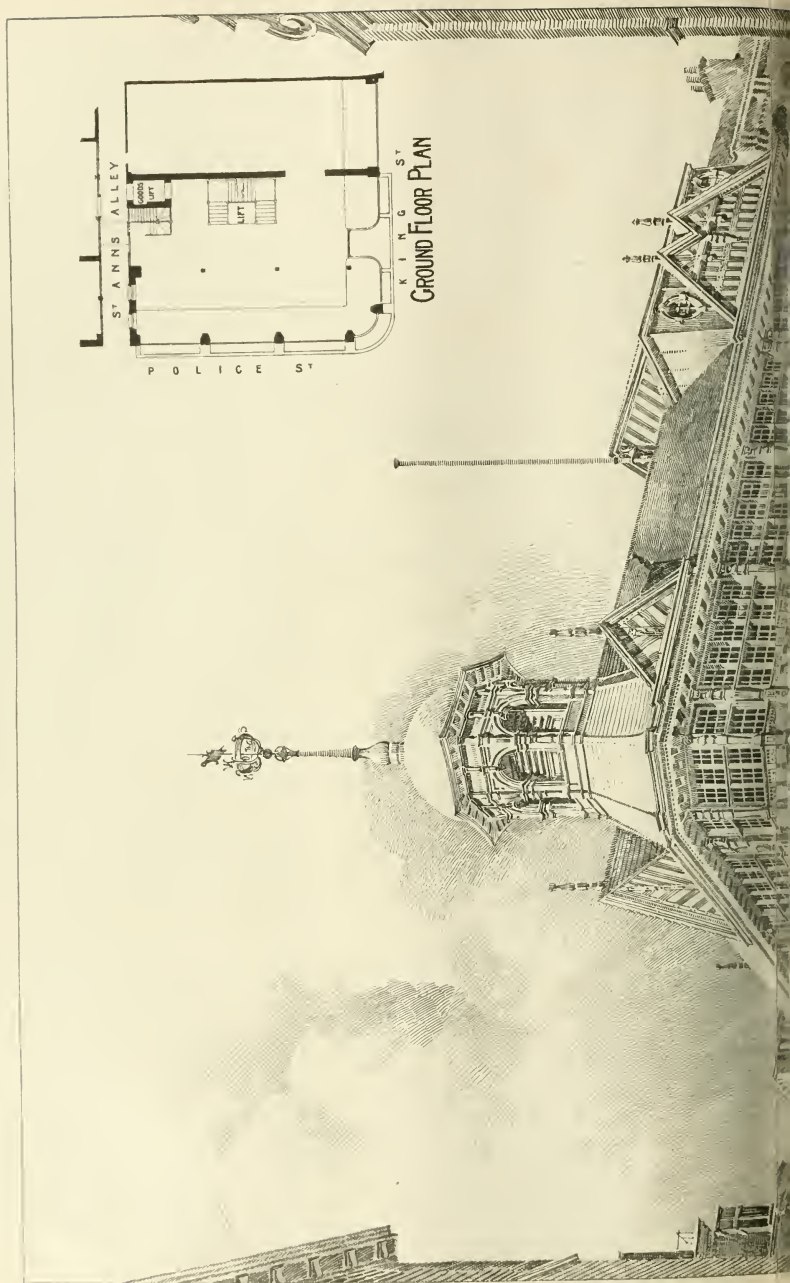
Bexhill—Isolation Hospital.	£25	E. Sholto Douglas, Clerk, Town Hall, Bexhill	Nov. 23
Bexhill—Laying Out 12½ Acres of Land as Ornamental Grounds	£20	E. Sholto Douglas, Clerk, Town Hall, Bexhill	Nov. 23
Bywater—New Schools		J. Cook, Clerk, Taywardine, Post Station, Cornwall	Dec. 17
Borden—Isolation Hospital	£100, £50	Arthur Ellis, Town Clerk, Burslem, Staffs.	Jan. 20
Kirkcaldy—Science and Art Schools (400 to 500 places)		Alexander Beveridge, Clerk to Burgh School Board, Kirkcaldy	Jan. 20
Kirkcaldy—Elementary School (400 places)		Alexander Beveridge, Clerk to Burgh School Board, Kirkcaldy	Jan. 20
Hull—Art School, Term £10,000 (Assessor, Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, W.C.)	£100 (merged), £60, £40	E. Laverack, Town Clerk, Town Hall, Hull	Feb. 1
Marble—Drawings for Electric Glasses, Alexandra Park	£100, £50, £25	The Agent-General for Victoria, 15, Victoria-st., Westminster, S.W. May 1	
Melbourne, Aus.—Statue of Queen Victoria (Marble or Bronze)			
Liverpool Cathedral—Drawings of Designs or Executed Work	300s. each to Architects in Final	The Hon. Secretaries, Church House, South John-street, Liverpool, June 30	
London, S.W.—Tractor for Military Purposes	£100, £70, £50	The Secretary, Mechanical Transport Committee, War Office, Horse Guards, Whitehall, S.W.	1903 Jan. 1
Landrind Wells—Laying Out Recreation Ground, &c.		D. C. Davies, Clerk to Council, Landrind Wells	
Plan—Drainage Scheme	£50	James Daly, Acting R.D.C. Clerk, Town, Ireland	
Northampton—Boarding-House and Playing Field (cost £5,000), Belling-road	No first. 2½s.	J. Haviland, Clerk to Governors, 2, St. Giles-square, Northampton.	
Northampton—Stanley Road Schools		J. Whitehead, Clerk to School Board, Chadderton, Oldham	
Northampton—Laboratories, &c. (cost £4,000), Abington-square		J. Haviland, Clerk to Governors, 2, St. Giles-square, Northampton.	
Leigh—Baptist Church and Schools		The Rev. W. Jones, Secretary, Hope House, Hilden Bridge	

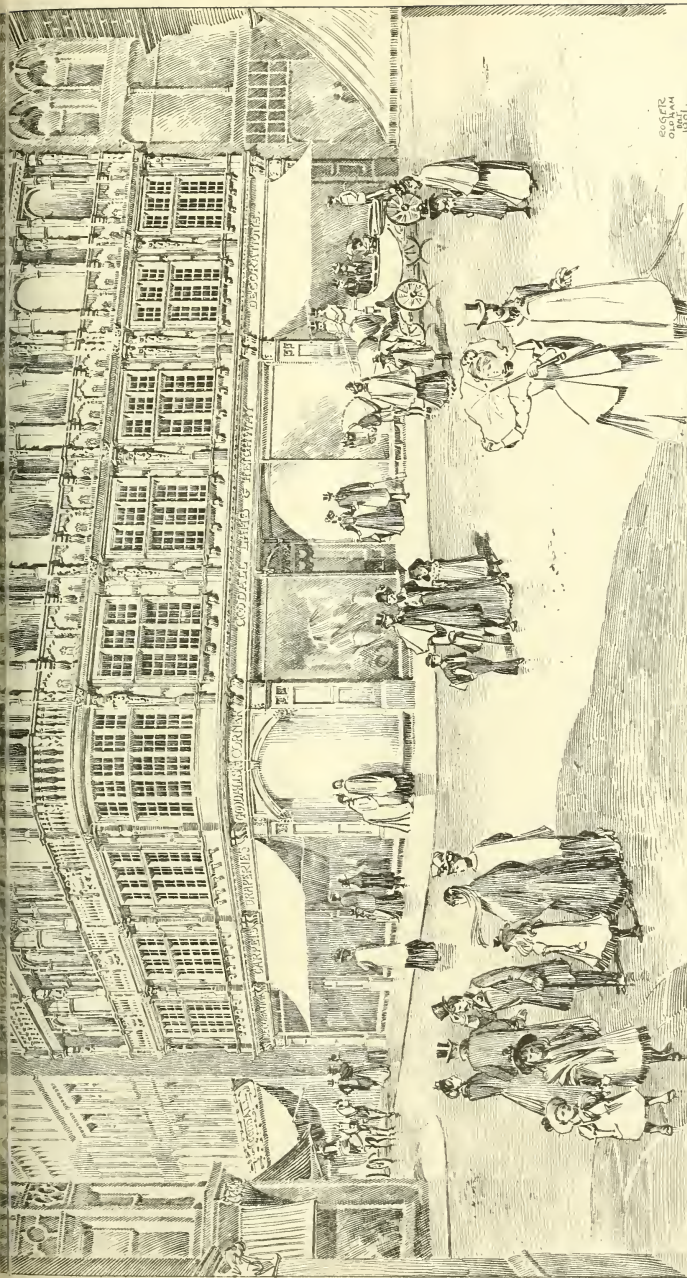
LIST OF TENDERS OPEN.

BUILDINGS.			
Bethlehem—Waiting-Room, &c., Joint Hospital	Committee	Alexander Cullen, Architect, Brandon Chambers, Hamilton	Nov. 23
Barnham—Eighteen Houses	Onwaman Cottage Co.	J. Llewellyn Smith and Davies, Architects, Aberdare	23
Barnham—Isolation Hospital		W. H. Bevers, A.R.I.B.A., 34, Bond-street, Leeds	23
Indington—Detached Villa, Flamborough-road	James Buckley, Headingley	A. R. Buckley, Belgrave-office, Office, South Cliff, Bridlington Quay	23
Lincoln—Alterations to Bell Inn	C. Edwards, Lincolns Brewery	B. J. Francis, Architect, Abercromby	23
Lincoln—Alterations to Wesleyan Chapel		Charles E. Butcher, Architect, 3, Queen-street, Colchester	23
Lincoln—Four Houses, Roundhay-road	J. E. Bonwell	A. R. Buckley, Belgrave-office, Office, South Cliff, Bridlington Quay	23
Leeds—Holbeck Free Library	Library Committee	William Bakewell, F.R.I.B.A., 35, Park-square, Leeds	23
Leeds—Barnes and Shop		Wm. Buck, Architect, Hornham, Sussex	23
Leam—In-Furnace—Two Houses, Dale-street	J. Nansen	J. Cowley, 10, Marsh-street, Askan-in-Furness	23
Leam—In-Furnace—Two Houses, Dale-street	Incorporation Directors	J. C. Bull, Clerk, Oswestry	23
Leam—In-Furnace—Two Houses, Dale-street	Gas Co.	John J. Jervis, Secretary, Gas Offices, Queen-street, Swindon	23
Leam—In-Furnace—Two Houses, Dale-street	Urban District Council	Fred H. Hare, Architect, Town Hall, Mirfield, Yorks.	23
Leam—In-Furnace—Two Houses, Dale-street	Northwick U. and F.D.C.'s	John Pearson, Clerk, Cockermouth	23
Leam—In-Furnace—Two Houses, Dale-street	Col. T. C. P. Calley	W. H. Bevers, A.R.I.B.A., 34, Bond-street, Leeds	23
Leam—In-Furnace—Two Houses, Dale-street	Committee	R. J. Bewick, M.S.A., Architect, 35, Regent-street, Swindon	23
Leam—In-Furnace—Two Houses, Dale-street	Hospital Committee	The County Surveyor, Oxford	23
Leam—In-Furnace—Two Houses, Dale-street	Corporation	Cresser and Knightley, Architects, Morebanc	23
Leam—In-Furnace—Two Houses, Dale-street	Town Council	F. E. P. Edwards, A.R.I.B.A., City Archt., Chapel-lane, Bradford	23
Leam—In-Furnace—Two Houses, Dale-street	Guardians	R. B. Platt, A.R.I.B.A., Architect, 2, Bank Buildings, Egan	23
Leam—In-Furnace—Two Houses, Dale-street	School Board	W. W. Lacey, M.I.C.E., Pom. Eng., Municipal Offices, Bournemouth	23
Leam—In-Furnace—Two Houses, Dale-street	West Ham Corporation	Llewellyn Jenkins, Clerk, Union Offices, Alexandra-road, Swansea	23
Leam—In-Furnace—Two Houses, Dale-street	Dr. Wetman	Hiberson, Fawcaker, and Groves, Architects, High-street, Newport, Mon.	23
Leam—In-Furnace—Two Houses, Dale-street	Corporation	Chas. E. Butcher, Architects, Midland Bank Chambers, Newport, Mon.	23
Leam—In-Furnace—Two Houses, Dale-street	Co-operative Society	John G. Morley, Borough Engineer, West Ham, E.	23
Leam—In-Furnace—Two Houses, Dale-street	Leamshire and Yorkshire Ry. Co.	Samuel Dyer, Architect, Bridlington	23
Leam—In-Furnace—Two Houses, Dale-street	Glamorgan County Council	Thomas and Sandilands, Architects, 241, West George-st., Glasgow	23
Leam—In-Furnace—Two Houses, Dale-street	Guardians	R. Walker, F.R.I.B.A., Windermere	23
Leam—In-Furnace—Two Houses, Dale-street	Consett Iron Co. Ltd.	The Secretary, Newbottle, Durham	23
Leam—In-Furnace—Two Houses, Dale-street	Certified Industrial School Managers	T. Mansel Franklin, Clerk, Westgate-street, Cardiff	23
Leam—In-Furnace—Two Houses, Dale-street	City Hospitals Committee	E. Hale Hubbard, M.S.A., Architect, 2, Bank Buildings, Egan	23
Leam—In-Furnace—Two Houses, Dale-street	Industrial Society	W. Thurnall, Clerk, Brook-street, Kennington-road, S.E.	23
Leam—In-Furnace—Two Houses, Dale-street	Rathmines and Rathgar U.D.C.	C. E. Oliver, Architect, General Offices, Consett, Durham	23
Leam—In-Furnace—Two Houses, Dale-street	Urban District Council	Jabez Wright, Architect, Macclesfield	23
Leam—In-Furnace—Two Houses, Dale-street	School Board	F. W. Wike, C.E., City Surveyor, Town Hall, Sheffield	23
Leam—In-Furnace—Two Houses, Dale-street	John Mudd	The Rev. W. Carr, Minister, St. Andrew's, Dalton-in-Furness	23
Leam—In-Furnace—Two Houses, Dale-street	Admiralty	Fredk. G. Hicks, Architect, 28, South Frederick-street, Rathmines	23
Leam—In-Furnace—Two Houses, Dale-street	School Board	W. H. Bevers, Surveyor, Council Offices, Wanders	23
Leam—In-Furnace—Two Houses, Dale-street	Mrs. E. J. Pugh	M. Hall, M.S.A., Architect, 29, Northgate, Halifax	23
Leam—In-Furnace—Two Houses, Dale-street	Co-operative Society	Nicholson and Hurrell, Architects, Hereford	23
Leam—In-Furnace—Two Houses, Dale-street	Building Club	The Director of Works-Dept., Admiralty, Northumberland-road, W.C.	23
Leam—In-Furnace—Two Houses, Dale-street	School Board	C. F. L. Horsfall and Son, Lord-street Chambers, Halifax	23
Leam—In-Furnace—Two Houses, Dale-street	Urban District Council	Robert Walker, F.R.I.B.A., Windermere	23
Leam—In-Furnace—Two Houses, Dale-street	John Mudd	W. Clement Willard, Architect, 29, Southgate, Halifax	23
Leam—In-Furnace—Two Houses, Dale-street	Admiralty	J. S. Moffatt, Architect, 33, Church-street, Whitehaven	23
Leam—In-Furnace—Two Houses, Dale-street	School Board	E. J. Pugh, Prince of Wales Hotel, Aberkint	23
Leam—In-Furnace—Two Houses, Dale-street	Urban District Council	John Farrer, Architect, 2, Colman-street, E.C.	23
Leam—In-Furnace—Two Houses, Dale-street	John Mudd	J. J. Milligan, Architect, Baxtergate, Whitley	23
Leam—In-Furnace—Two Houses, Dale-street	Admiralty	T. Roderick, Architect, Ashbrook House, Clifton-street, Aberdare	23
Leam—In-Furnace—Two Houses, Dale-street	School Board	W. Clement Willard, Architect, 29, Southgate, Halifax	23
Leam—In-Furnace—Two Houses, Dale-street	Urban District Council	Sampson Hill, Architect, Green-lane, Redruth	23
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THE BUILDING DEWS, ROYAL 22, 1901.





1901

NEW PREMISES FOR MESSRS GODDALL LAMB & HEIGHWAY - LIMITED
KING-STREET & POLICE STREET MANCHESTER

MAXWELL & TUKER
ARCHITECTS
MANCHESTER

DESIGNED
BY
MAXWELL & TUKER
1891

Printed and Published by Messrs. J. & W. G. & Co., 6, Queen Street, W.



THE BUILDING PAWS DOVE 22, 1901.

Borough of Royal Leamington Spa
Free Library, School of Art, and Technical School

J. Mitchell Boultonley
Architect



General Plan

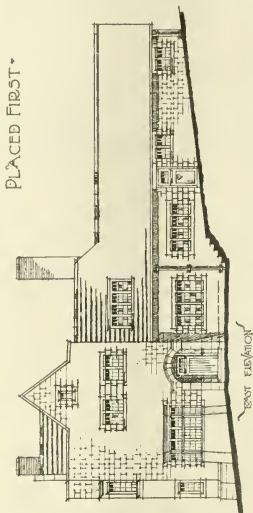
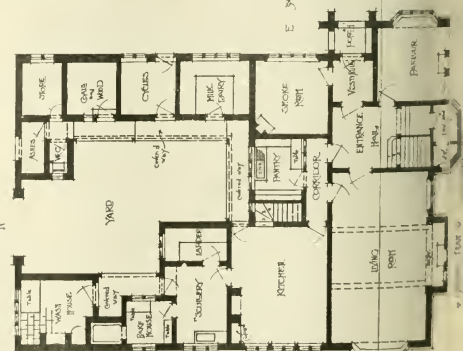
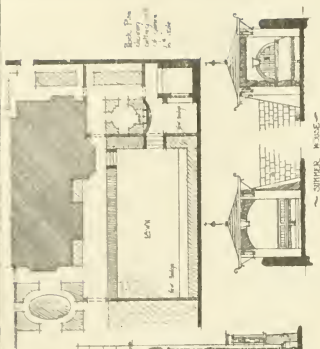
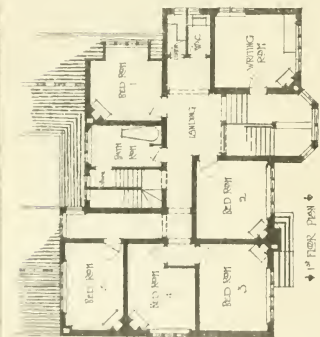




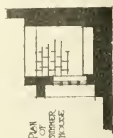
THE BUILDING JEWES [OVER 22, 1901.]





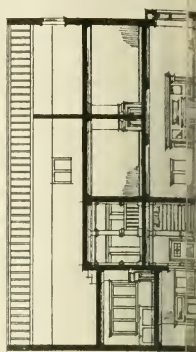
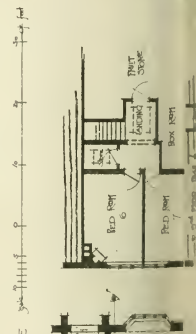


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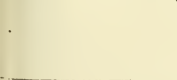


B-N-D-C

A COUNTRY SIDE FARMHOUSE

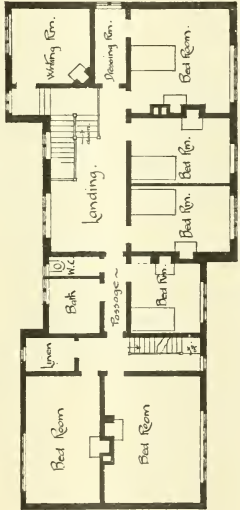
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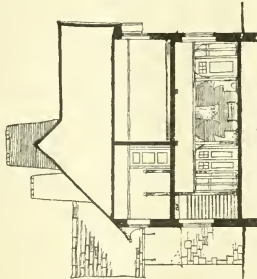


South Elevation

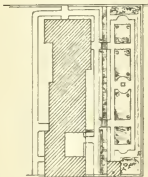
East Elevation



First Floor Plan

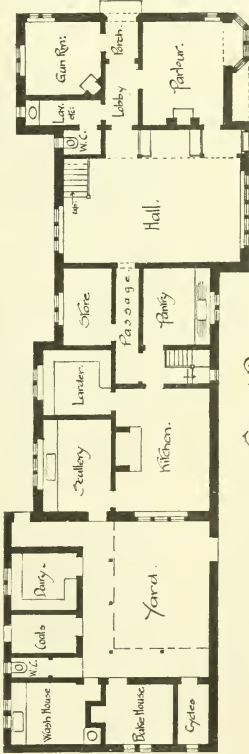


Cross Section

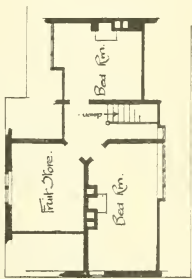


Black Plan

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Ground Plan



Attic Plan

Plans photographed by Robert Adams, 6, Queen's Square, W.C.

AT SPRING GARDENS
BURY ST EDMUND

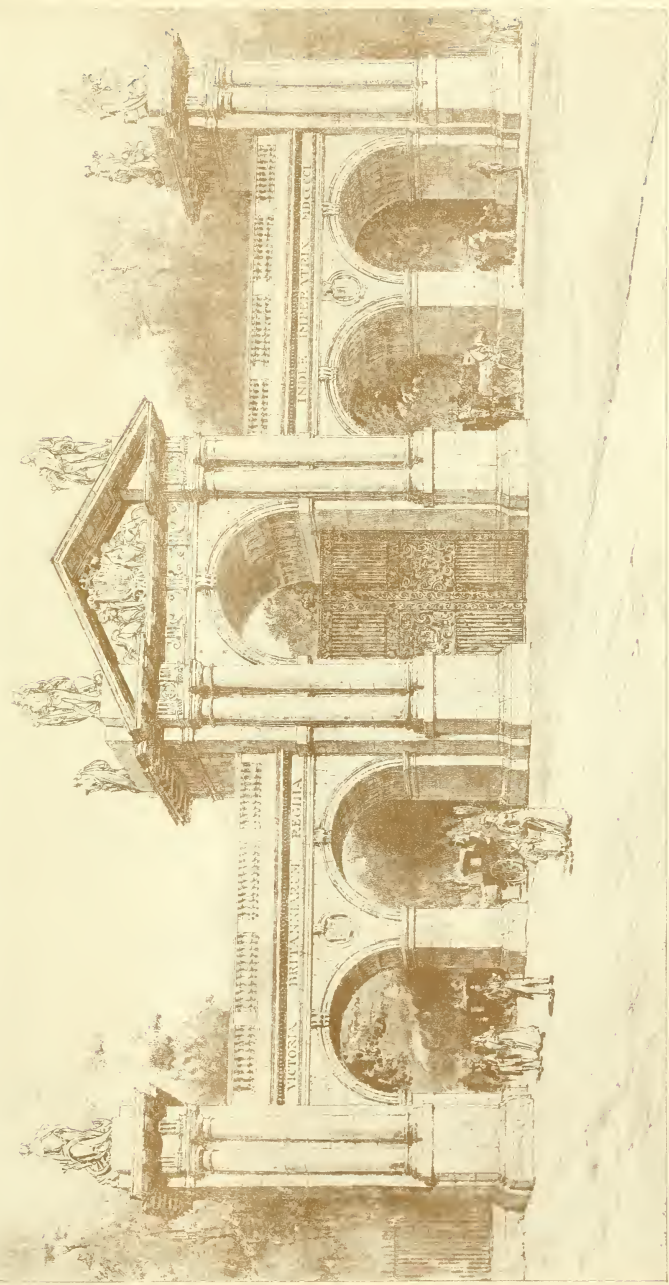
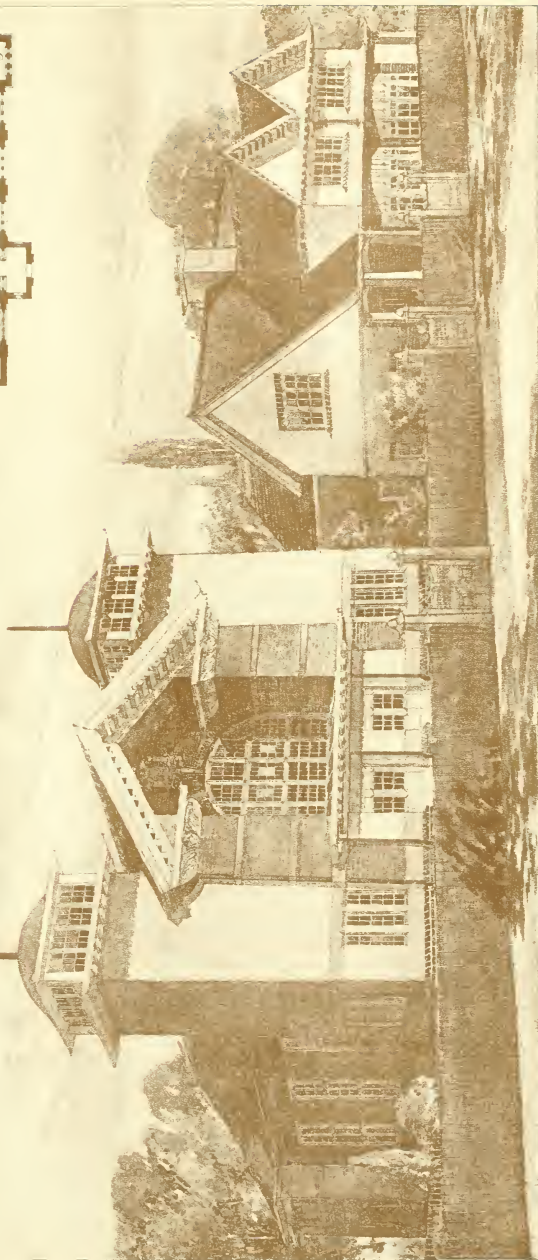
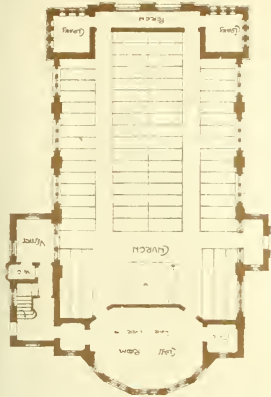


Photo. Taken by Messrs. Adams & Sons, 1894

DESIGN FOR THE QUEEN VICTORIA MEMORIAL, BUCKINGHAM PALACE, S.W.
SUBMITTED BY ERNEST GEORGE, F.R.I.B.A.





• FREE CHURCH, GLASGOW • RAIL GOSPEL AND DAVID ALAN

THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXXXI.—No. 2447.

FRIDAY, NOVEMBER 29, 1901.

MODERN DEVELOPMENTS IN BUILDING.

NEW will deny that we are passing through an experimental stage in our building and art, in the wider and more numerous applications that the architect has to meet, as well as in the progress of legislation as it affects building. No one can dispute the artistic and constitutional evolution that is taking place. For the last thirty years, at least, we have been copying, pulling to pieces, analysing every phase of ancient art, and we are now engaged in formulating a new architecture, the conditions of which have immensely changed. Amongst these the results of competition stands first in its effect on building and the architect—the desire to erect cheap buildings and to obtain the best talent at the lowest price; next in importance is the wider application of building to numerous purposes unknown half a century ago; then the absorption of new materials and new systems of construction, its enlistment of engineers and other experts; and, lastly, the greater demands of town life. It will be impossible to show in one article how each of these causes has operated to alter the conditions of modern building.

Two or three decided developments of these conditions have to be faced by the modern architect. One is the importation of the engineer and foreign elements—the development of specialism. We have lately shown the extent to which engineering in several branches has entered building construction in the form of heating, lighting, ventilating, and electric-power machinery, and to what extent the architect has to plan and design his large buildings to adapt them to these several requirements. The combination of structural work with installations of a more or less mechanical kind has considerably enlarged the architect's sphere of duties, while it has obliged him to be conversant with the scientific principles involved in heating, ventilating, lighting, electro-motive and hydraulic agencies in the development and transmission of power.

The design and construction of our large city buildings, hotels, and blocks of offices and flats the engineering features bulk largely. We have not only deep and costly foundations, involving piling, pneumatic caissons, forming watertight dams as well, and pumping appliances, but steel frames, fire-resisting floors and roofs, hydraulic and other lifts, heating arrangements, ventilating appliances, electric lighting, and other things. In the American "high building," the construction involves 20 to 25 stories or floors, which, with their loads, are carried on the steel frames that also support the exterior walls. The modern steel skeleton structure may probably in a few years take the place of the solid brick walls of our city buildings, the exterior solid walls encroaching largely on the area if carried up in compliance with the schedule of the Metropolitan Building Act. The steel skeleton, on the contrary, occupies a small area of the floor space, and supports the total weight of the entire structure and its several floors. These foundation loads are distributed over a large area of concrete and steel grillage, or they may be concentrated at intervals on columns. All this involves a calculation of the loads and the safe resistance at the points of support. In the high-building skeleton the columns require to be carefully calculated, as the loads on the girders or rolled beams are generally supported on cast-iron brackets, or bolted to

the columns, or riveted, and these loads are therefore not central with the columns, but require nice calculations to be made for excessive loads. Unless provision is made for these beams in some other way, the columns receive a load that tends to bend them, and therefore their strength for vertically-disposed or axial loads is useless. It will be seen, therefore, for structures of steel framework, the architect must bring to his task a knowledge of stresses induced by eccentric loads, as well as a technical acquaintance with iron and steel. We lately noticed that in several late buildings in New York, as the Mutual Life Building and the Stock Exchange Building, considerable engineering skill has been exercised in the construction of the pneumatic caissons for foundations which not only carry the walls, but protect the basements from water, and enable them, below the water level, to be used for boilers, storage, or other purposes. We cannot expect the professional architect to master all those duties. They are special qualifications: they imply a knowledge of engineering which few architects can be expected to attain; and the consequence has been the development of special branches of construction. Mr. Max Clarke, in his paper on "The Hygiene and Sanitation of a Country House," put a useful suggestion: "Which articles require to be self, and what leave to others? and he referred to drainage. Of course, for an ordinary house or premises the architect is expected to know the best system of drainage, where to put his gully-traps, his disconnecting-chambers, branch-pipes, ventilating and fresh-air inlets; but the drainage of a large country mansion or commercial building involves a complex plan, and the service of a sanitary expert may be necessary. Questions of sanitary details, like closet apparatus, flushing cisterns, lavatories, sinks, traps, baths, and cisterns, involve expert knowledge, which is wisely required in the early days. And so of many other technical requirements of the modern-equipped building, heating and ventilation arrangements, electric lighting and hydraulic lifts, unknown to the architect a century ago. These matters all tend towards a scientific conception of building, while conditions that favoured art are disappearing. Every part and fitting of a building has to be built or designed to suit inventions and apparatus; restfulness and repose are sacrificed to the invasion of modern fittings of elaborate make that are quite foreign to the artist's work. In the course of a few years we may expect to see further improvement in the design and application of fittings and building appliances, a better taste displayed in constructional ironwork, metal fittings, and manufactured articles. At present there is conflict; the architect has to consult engineers and experts, to adjust and to try to mitigate differences and disagreements, all of which leave him little time for art.

Large building operations by companies and syndicates form another development that has much altered the conditions of building in our time. There is a demand for huge buildings for commerce and habitation, in which American millionaires throw in their money and interest, as in the proposal by an English-American syndicate to erect an office building on one of the best sites on the Holborn and Strand Improvement. In these operations real architecture is at a discount, unless it takes the form of embellishment. The architect in fact plays a subordinate part: his individuality is lost; he has to consult committees' experts, co-operate with many specialists. All single-heartedness in his work is rendered impossible; he has to produce a building that will compete with others in the same line of business. The whole undertaking is from beginning to end commercial. The directors of the company first advertise for designs in

competition, so as to obtain what they think the best design at the cheapest rate. Afterwards they alter and modify the plans, obtain the lowest tender they can, and all through the work, the architect's efforts are mainly employed in cutting and adjusting the design, making compromises with engineers and tradesmen. If there is any artistic ability displayed in this design it is soon stifled or suppressed by requirements of managers and officials. There is little honest architecture under these conditions; the personal factor is suppressed or lost, and the exterior is the only part of the design that revels in ostentation of a vulgar or *bisore* kind. If it is a large shop it is softened externally by a profusion of features that have no correspondence with the interior; if a hotel, the facade is left to the architectural carver and the apartments to the upholsterer and decorator. The architect's business is really to give opportunities for these and other trades to make a display of their goods; the building becomes a huge advertisement for Messrs. So-and-So, miscellaneous tradesmen, and others whose names figure before the architect's. Really the architect's work has been mainly to obtain a contract and let the work to the various trades—a species of agency unknown to the profession a century ago, when clients employed an architect because of his known abilities, consulted him, and placed the whole design and work in his hands.

There is another aspect of the extent of modern building enterprises: that is the tendency to economise material and labour by the adoption of regulation rules and stereotyped designs. A repetition of a number of unit buildings like workmen's cottages, barracks, hospital wards, and the like, is quite a modern departure, quite opposed to the development of architecture and to individual effort. The building speculator who leases land for speculation resorts to the like method of repeating, *ad nauseam*, the elevation of the terrace house along miles of new streets. In Swedish joinery we meet the same repetition of doors and window-frames, and now the question of standardising iron and steel sections is being considered by our engineers and iron and steel masters. In America this tendency to fall into special grooves is carried to a much larger extent, and is one cause of the successful competition for certain works which America wages with us. The old builders knew nothing of this economy, though they worked on well-understood and traditional principles; their buildings were not intended for huge crowds of labourers, or inmates necessitating repetition of similar rooms. This is a problem left for the present age to solve—accommodation for large aggregations of like units in precisely the same circumstances, and with the least expenditure of material. The huge modern hotel, or block of dwellings, the modern workhouse and barracks are structures that are products of an age of experimentation and trial. For all we know, better and happier solutions may reveal themselves by-and-by. Already the shortcomings and morose tendencies of huge hotels and clubhouses for the working man are beginning to be realised even in buildings provided with common kitchens and living-rooms on the most economic system: there appears to be a loss of personal responsibility and of home life injurious to the complex wants of man. In our great hospitals the large ward is also found to give less results in the cure of disease than single or double-room wards, and experiments all lead us to the conclusion that much money has been wasted in our huge establishments for housing the poor and infirm that would have been better expended in the construction of contained dwellings and cottage hospitals. The experiments made in this direction by the Local Government Board are of interest and lead to the further question of design.

important matter—that will be the architect's action.

In another direction the question arises in the British workman and his attitude towards the profession. The architect has not what his great ancestors had—well-trained, whole-hearted, and personally interested craftsmen to deal with. There are instances of good workmen, true and honest; but they are not to be got with the architect in large contracts, and, beyond which, they are controlled by trade-unions, as we noticed last week. We should be sorry to say that some bricklayer who cannot lay 1,000, or even 600 bricks a day is dishonest, for we must consider the kind of brickwork, whether it is "inside" or "outside," whether it is straight setting, walling, or "corner work," before we can fairly judge of the man's output. The course of modern building is the hurried way in which it is done. The man who can lay 1,200 bricks, and has to work as fast as he can without stopping to think how he is doing it, is not fulfilling the highest destiny of his trade, but is rather making himself a machine. Against this sort of mechanical expertness we protest, but perhaps the "limitation of output" cry has proceeded from those who are not anxious to make the workman an art-craftsman. May it not be that there is something to be said on both sides? The stories of the *Times* correspondent, if they can be verified, are disheartening; they indicate a recklessness unworthy of the trade in wasting time, and show a questionable policy on the part of the unions; on the other hand there is the builder, who, to meet his low tender, has to get his work done quicker and cheaper, and if he can find willing men to take work under a fair price he will do so, to the injury of the trade. The "limitation of output" has, to some extent, been the natural reaction of the low-tendering and contract mania of recent years, and both the cause and the insult must be taken home to task. The condition of the trades at present does not lead us to expect much from the artisan idea of art workmanship, of which we have heard so much—a condition that can only prevail when the attitude of the workman is less militant.

STANDARDISATION OF IRON AND STEEL.

IN the design of iron and steel structures, it has been customary for architects and engineers to specify sections and sizes that are not obtainable in the iron and steel manufacturers' stock, and these sections frequently differ in some slight and immaterial degree from those which are published in pattern books; in consequence of this slight divergence in shape and dimension, the contractor has to cut new rolls to agree with the specified sections, and thereby to expend a considerable sum for perhaps a specially designed tee or angle-iron which may never be required again. In tendering for work of this kind, the contractor has to exercise caution, and put a large addition to his price per ton to cover the cost of cutting rolls; but many works, such as iron or steel roofs and bridges, the stock patterns of a good firm are adopted and a saving effected. For architects or engineers will be found to insist on a certain section of a girder or flanged joist that is within an inch more or less in depth or width of a section in stock, or of a thickness an, or less than a pattern. In order to work out a plate girder of similar strength to one specified, using sections which can be obtained instead of those named in the specification, a considerable saving is thereby made. Standard sections will be of great convenience and utility to those who have to design and construct iron structures in which the same standard patterns are used. The question for discussion is whether we are to adopt the

metrical system to keep our own inch unit, as an important one, and will have to be considered if British practice is to be accepted on the Continent. To adopt the metric system of measurement of our sections would largely extend our export trade.

Our German and American rivals in manufacture will continue to hold the position they do by the adoption of certain standard sections for iron and steel construction. It is well known that architects, engineers, and others, by insisting on sections of iron and steel girders, tee and angle iron, that cannot be procured at once, seriously hamper and delay their work, and increase materially the cost of the construction. A correspondent in the *Times* of Saturday last reopens the question of the standardisation of iron and steel sections, by referring to the letter from the Secretary of State for India to Mr. Baird, M.P., with regard to contracts for locomotives for the Indian State railways with foreign firms—not very edifying reading for the British manufacturer. The *Times* correspondent says the larger part of this difficulty "is due to the chaotic and unmethodical system which prevails in this country of supplying such details as iron and steel girders, rails, angle-irons, and similar sections to any fractional dimensions which chance may have led the purchaser or designer to adopt." He shows also that our engineers are hampered and delayed in carrying out these designs "by not having any definite sizes for the component parts of their bridge, locomotive, and ship designs," and it is therefore impossible to carry them out with the materials supplied by manufacturers out of stock. From all points of view, therefore, it is of vital importance that where diversities of dimension in small details do not affect the strength of the structure, fixed standards of sections should be made to which both designer and manufacturer can work. The designer would feel more satisfied if he had a list or table of sections to which he could refer when he was designing, say, a bridge or a large roof, and the contractor would also be enabled to obtain the price per foot of any girder, joist, or rather without any difficulty, and to compete at the same price with others on a fair basis. Manufacturers who rolled these standard sections would be sure of having a ready sale for them, would keep them in stock, and could supply them in demand upon reasonable terms, instead of, as now, having to cut special rolls before they can turn out the particular order. The writer of the article remarks—what is true—every 20, 30, or 100 tons that are required here demand the cutting of rolls to suit each shape. A large expenditure of time and money is required to shift the rolls on each small order of, say, 100 tons, whereas if standard sections were used this outlay would be spread over some thousands of tons. As in America no special roll is made for a less order than 4,000 tons, it follows our Transatlantic rivals are in a position to put in much lower tenders, and to supply the goods in much less time than any British firm.

It is satisfactory, therefore, to find that representative engineers have initiated this reform. Sir John Wolfe-Barry has urged the matter; the Institution of Civil Engineers, the Institution of Mechanical Engineers, the Institution of Naval Architects, and the Iron and Steel Institute have co-operated in forming a standards committee of a very influential character, who are taking evidence preparatory to dealing with the several branches of engineering. Sir Joseph Whitworth commenced the standardisation of screw-threads and gauges, against which proposal manufacturers loudly protested, as it would interfere with their business. According to the evidence before the committee, there are over 171 sections rolled in our mills, in Germany there are only 67 standard sections, and in America only 19. Every railway company here adopts its

own section, or sections, of rail; tramways also use several, whereas a very few sections would suffice for all the variations required in practice. Evidence points to the chaos in British locomotives, where three types of equal power and weight differ in almost every detail, necessitating new drawings, new patterns, new templates, at a cost of £2,000 from the same office and builder; in other cases, engineers often hold out for trivial differences and thicknesses instead of taking the nearest section they can get in stock, and thus require rolls to be cut at an outlay of £150 or £200, making all the difference between securing or losing the contract. A new set of rolls for one structure may be required at considerable cost which may not be wanted again, whereas the Illinois Steel Company will only quote upon their own standard specifications for steel rails, &c., amounting to nearly 3,000 tons. When the quantity of any given section is small, and the engineer insists upon the exact shape, the cost per ton adds materially to the cost. The tests also required for materials for the same purposes vary, and involve extra cost. For instance, the Admiralty, the Board of Trade, Lloyds', and others have tests all differing, instead of one uniform test for each material.

There are certain disadvantages in uniform or standard sections, from the architect's point of view, the greatest being that uniform or regulation sections will hamper design; but when we consider the very unimportant and almost infinitesimal differences made in iron and steel sections, the objection does not weigh at all. It would be very different if the sectional forms themselves were cut to certain shapes; but the difference in the depth of a girder or joist of 1 in. or 2 in., or in the width of flanges or their thickness 1/4 in. or 1/2 in. greater or less, cannot make the slightest visible change in the proportions. We lately reported a meeting on the standardisation of bricks, to which we might as well make the same objection. Of course a certain latitude must be allowed. When occasions require, new sections will be made to suit circumstances; but this reform can be made from time to time by a standards committee, as suggested. If it were intended to set up certain standards in design or construction of bridges, &c.—that is, to fix on certain methods of arranging girders or ribs for given spans and loads—our objection would be still more serious, as the standard would hamper and restrict invention to a serious extent. One other point has to be considered by the committee appointed, and that is the adoption of a unit of measurement. The inch unit, employed also in America, does not hold good on the Continent, where the decimal system of measurement and weight prevails, the unit of size being the metre, sections being rolled to millimetres, and the weight measured by the gramme. The result of the want of uniform measurement is to restrict our manufactures. As the *Engineer* says, "the result is that nowhere in Germany, Austria, France, Italy, or Belgium do the steel sections manufactured for ship-building correspond in form or dimension with those produced by our own steel manufacturers. Thus, if a ship is built to Lloyd's classification in France, and constructed of French manufactured sections, the builder has to find the sections in his stockmaker's pattern-books which correspond nearly with those laid down by the rules of the Register Society. None agree closely, and as Lloyd's allow no reduction in scantling from their rule requirements, the chances are somewhat larger and heavier scantlings are used." The same journal points out the standardisation of components of a steel ship, such as angles, tee-bars, bulb-plates, bulb-tees, angles, channels, &c., is practically adopted by the rules of Lloyd's "Register of Shipping," and no difficulty is obtained in this country in obtaining the sections. This did

not arise "from accident, but by makers first conferring with Lloyd's surveyors and then cutting their rolls accordingly," and the same has happened in regard to the lengths, breadths, and thickness of plates—these are rolled to 20ths of an inch. In fact, from a manufacturer's pattern-book, the shipbuilder is able to get all the materials required for any ship he may have to build. But the contractor or engineer is not so well off; he has to look through many pattern-books of sections before he can find the section specified. In the States the steel made goes largely for the "sky-scraping" buildings, and the bulk of the steel sections used by the American shipbuilders is said to be taken from "the house architect's pattern-book," and are therefore not so suitable for ship-building as the sections produced here. It will be seen the subject of steel sections manufactured for railways, bridges, building tall houses in the States, as well as for ship-building, is one of considerable importance, and corresponds with four great industries. For each of these special purposes certain varieties of sections are necessary, and ought to be supplied; but these may be reduced in each of them to a few standard shapes and sizes with which the professions in time would become familiar. Standardisation in this manufacture would settle many points as regards strength, largely facilitate estimation of weight and cost, and, as we have seen, would considerably reduce tenders for works in which thousands of tons of iron or steel are employed.

THE SOCIETY OF ARCHITECTS.

THE inaugural meeting of the seventeenth session of the Society of Architects was held last (Thursday) evening at St. James's Hall, Piccadilly, W., when the President, Mr. STURGEON TREVELL, J.P., F.R.I.B.A., of London and Truro, delivered the opening address. Having alluded to the excellent work done in the past by the registration and to the part played by his predecessor in the chair, Mr. Walter Emden, by Mr. Ellis Marsland, the hon. secretary, Mr. Quartermain, the treasurer, Mr. McArthur Butler, the secretary, and others, the President referred to the relative positions of the three great bodies representing the profession—the Institute, the Association, and the Society. The Royal Institute of British Architects was undoubtedly first in seniority and membership, and they honoured the long roll of distinguished men who had been identified with its labours and the able men who were now guiding its destinies, more especially as they found that, after mature consideration, the Society's views were in process of adoption by the Institute in regard to such important questions as registration, ancient lights, and others where the Society had taken the initiative. The Architectural Association was doing a most useful work as an educational body for the special training of the rising generation of architects, and to them as the steadfast advocates of educational qualifications themselves, the Society could not but wish the greatest possible success. Lastly came their own society, which might be regarded as the body primarily formed to look after the business side of the profession, whilst not ignoring the educational, the scientific, or the artistic. Established in 1884, it had had a vigorous growth to have attained the numerical and financial position it occupied to-day, as well as being able to make itself felt upon questions of the hour that affect either the architectural profession or the various trades allied with building operations.

BUSINESS AFFAIRS.

It is, the President continued, to this business aspect of our society that I purpose to address myself to-night, as being more in accord with the wishes of my professional brethren, especially those in the provinces, who suffer in a greater degree than do those in the Metropolis and larger provincial cities from the neglect of the central architectural bodies in taking up practical matters that affect the everyday life of the provincial practitioners. In London, and in the larger centres, the position of an architect is better defined and understood; his qualifications, his executed works, and his professional status

are recognised. In smaller places these points have not the same weight, and in too many instances the qualified architect stands simply on a purity in the public mind with another calling himself by the same name, regardless of the relative qualifications of the two. Instances of wholesale plagiarism, and abuse of the term "architect," come almost daily under the observation of country practitioners, that would simply be regarded as incredible, and could have no existence in our larger centres, through the different conditions that obtain there. I regret to say that the local district surveyor's office, in small provincial towns is frequently made the medium of plagiarism of the most impudent description. Plans and sections of new buildings have to be deposited in accordance with the provisions of the local by-laws. The local council, acting upon the recommendation of their surveyor, issue no notice to the effect that these must be in duplicate, one set to be retained by the authority, and the other for stamping and return. But latterly elevations as well as plans and sections have been required, with the result that complete sets of drawings, minus the details, are in the archives of the surveyor and his batch of assistants, so that they have a complete record of all the work done in that particular town or district.

HOW IT IS DONE!

Soon we see the effect. Mr. A. builds a residence in the locality from designs furnished by a London or other distant architect of recognised standing. Afterwards Mr. B. wants a house, and likes the style of Mr. A.'s residence. It is known locally that Mr. B. is about to build, when he is visited by either the local surveyor or some member of his staff with the plausible intimation that if Mr. B. wants a residence like Mr. A.'s, everything can be done for him in the "office" much more expeditiously, and better than can be the case from a distance, at a cheaper rate, and with the certainty of the plans passing the authority without revision or delay. The result of course is that the surveyor or his assistant gets the instruction to proceed, and forthwith does so by providing himself with the necessary sheets of tracing-paper or linen, copying the deposited plans in his possession, after making such trifling modifications as the altered conditions may necessitate. Of course, I am aware that such a state of things could not for a moment exist in the Metropolis or in our larger municipalities, where district surveyors have something else to do, and would scorn such practices; but they do exist to an extraordinary extent in our smaller ones. All local surveyors and their assistants should be delinquent from practice as "architects" as a condition of their appointment—at any rate within the areas over which they have adjudicatory powers.

CHARLATANS.

But the class I have mentioned have some knowledge of architectural work, and certainly of drainage and sanitary matters, and, with this, possibly greater excuse for "dabbling" than other examples that have come under my notice, where board schoolmasters, builders' clerks, auctioneers, land agents, general contractors, clerks of works, boys from the nearest art school, photographers, highway surveyors, and in one instance a marine store dealer, have signed their names to plans and submitted them to local authorities, and otherwise acted as professional advisers to their clients. With such absurdly unpractical drawings as is the natural product from such sources, something generally happens either during the progress of the building or afterwards, when the fault is discovered by the architect, and our profession as a body gets stigmatised.

REGISTRATION.

This naturally brings me to the subject of the Statutory Registration of the Architectural Profession—which was one of the main objects for which this society was established, and which still remains the cardinal article of its faith. There is greater activity of late years for registration to-day; indeed, almost every civilised state worthy of the name has adopted the principle in some shape or form. A first-rate artisan finds it necessary to acquire a knowledge of the principles of his craft, as well as the mere "rule-of-thumb" part of it, before he can lay claim to be a joiner, mason, plumber, or any other of the chief trades required in a building; and technical schools now raising all over the country, thanks to the fore-

sight of such great patriots as Mr. Passmore Edwards, Mr. Carnegie, and others, give him the opportunity of acquiring this knowledge. If this be so in the case of men holding a subordinate position in the creation of the general structure, how much more so in the case of the architect, who directs and equips the chief craftsman or the architect. And after he has been trained with so much care and expense, what is more natural than that the State should give him his proper status by diploma and registration, as it does in the professions of medicine and law, and many others where the conditions are similar. In certain quarters there has been some fear that qualification by special training and examination, with compulsory registration following, would be productive of a low average mediocrity, and might prevent the artistic genius from ever entering the profession. It would do nothing of the sort. It would raise the general standard of efficiency and the general status of the profession, and real genius would have quite as good opportunities of coming to the front, if not better, than it has to-day. Illinois has adopted the statutory registration of architects, and Professor Clifford Rinker, the chief examiner of the State Board of examiners, said, so lately as March last: "The general results of the law (registration) have been decidedly advantageous to the public as well as to the profession. The professional education and training necessary to the successful practice of architecture were very materially increased during the existence of the law. Nearly one-sixth of the number of architects licensed without examination have been replaced by men who passed the examinations now required. Since this change has occurred within 3 years, it may reasonably be expected that all incompetent men will have left the profession and the class of the next ten years, when all practicing architects will either have passed the examinations or possess equal preparation for their work. The professional standing of the architect should then, in Illinois, equal that of the lawyer or the physician." This Society has always insisted that the Royal Institute is the proper body to take the lead upon registration. If the Institute will not initiate the movement, is this any reason why matters should be allowed to drift from bad to worse? Let the Institute lead the way and the Society will follow, and loyally support any measure embracing the principle of the proper standard of qualification with diploma and registration.

WHAT ENGLISH PROVINCES SAY.

Mr. W. Carby Hall, F.R.I.B.A., President of the Leeds and Yorkshire Architectural Society, in his opening address last year, supported the principle of compulsory registration, and what he so well expressed is simply what is re-echoed at Newcastle-on-Tyne, Exeter, and every other large centre visited by deputations from this Society, where at each point societies allied with the Royal Institute and Fellows and Associates of that body have spoken in the same strain. Having quoted Mr. W. H. Seth-Smith's remarks on registration in his recent presidential address to the Architectural Association, the President turned to the subject of

ANCIENT LIGHTS.

Who amongst us, he asked, when starting a building in a town, has not been threatened at the very outset with an injunction? Frequently. Upon the most flimsy grounds that could only be described as an excuse for an attempt to levy blackmail upon the poor, having the money to build, is supposed to be good game to be plucked for fanciful damages and costs.

A TYPICAL CASE.

In one of such instances, where I happened to be the architect for the new building, we pushed our building back by 3ft., but went 3ft. 6in. higher than the old one that previously stood on the same site. But although there was a space of something like 30ft. between the two buildings that had been increased by 3ft., we were sued by our neighbour opposite for damages to his lights! After close upon six months' preparation of the case on both sides, with a whole crowd of witnesses, expert and otherwise, and five days' waiting at the Law Courts in London to all of them for the termination of the case that was in front of ours, the hearing came off, and occupied another couple of days. The result of it all was that no damage could be proved against any of the windows on the ground, first, or second floors; but that there was one little window of the basement just peeping above the pavement

level, necessitating an additional 10 ft. of glass area, that the learned judge thought it desirable to have the light suffer an infinitesimal diminution of light, because we had gone 5 ft. 6 in. higher than the previous building, although we had gone backwards 3 ft. For this he awarded the sum of £30 damages, and this carried the costs against the building owners, which amounted to over £300, although in delivering judgment the judge had characterised it as one of the most trifling cases that had ever been brought before him, and that it ought never to have been taken into court. So much for the law, which was perhaps technically right, but how about the justice? and what inducement was there after this for other property owners to improve their properties with such risks as these staring them in the face? The experience has since been that when an owner smells a claim of this sort as likely to arise, he at once cancels his instructions, buttons up his pockets, and allows matters to remain just as they were, to the detriment of the locality, the ratepayers, the architect, and the property itself.

WHAT ARCHITECTS WANT.

Now, what we, as architects, require, and what the British public want, is a preliminary court of appeal in each locality, where plans can be deposited when any improvement is contemplated, and likely to be affected by them. Those who may adjoin should have notice of what was intended, and the full right of inspection of plans, and the pros and cons should then be gone into fully, and if in the opinion of the court damage was likely to be sustained, they might say so with or without assessing it, as might be agreed to on both sides; but, at any rate, to have the power of giving a verdict as to the effect of the work, if the damage in their opinion was not such as to materially affect the user of the complainant's premises, when the subject of actual damage sustained could be lawfully ascertained by arbitration or in the law-court in the usual way.

ARCHITECTS' DUTIES.

There are other subjects of an essentially practical character that the Society might fairly express its opinions upon. I was not long since accosted in the street by a gentleman who, as a member of many building committees, has had a good deal to do with different architects, and he told me that he was astonished to find such a great variation as existed among architects as to what services should be rendered for the ordinary commission of 5 per cent. He remarked that if there was a clear and definite statement upon the matter it would be of great advantage to the profession as well as to the public, and be a means of securing uniformity of practice. Now we, as a body, do not want to be told what is included in our ordinary fee of 5 per cent.; but as there are others outside who would like to know, and seeing that anything that will conduce to uniformity of practice is a distinct advantage, I will take upon myself to define the duties concisely as follows, as coming within the ordinary commission—(1) Receivable preliminary sketches in pencil, revised until the wishes of the client are exactly ascertained. (2) Approximate estimate of cost, such as may be obtained by cubing. (3) Preparation of a full set of one-eighth scale drawings complete in all respects, with one traced copy of the same for the builder's use in carrying out the work. (4) A complete detailed specification with conditions of contract, and in duplicate, one copy being for the builder's use. (5) Advertising and obtaining tenders for the work if let by public contract. (6) Complete details, sufficient for the ordinary workman in each trade to execute his portion of the building. (7) Working mean 1/4 in. or 1/2 in. scale drawings of the better class of work that might differ, and half and full size sections of all moulding and the more delicate parts, and that full and explicit instructions for the proper execution of the work should be given in all cases. (8) Personal supervision by the architect or his deputy should generally be made monthly, or say once in six weeks, dependent upon the size of the buildings. For all other services, such as extra copies of the plans for local authorities, for taking out quantities, surveys of site, arrangements with adjoining owners, travelling or other out-of-pocket expenses, the architect is entitled to charge separately.

EXACTING CLIENTS.

I have made this statement for the benefit not only of my quierist of the building committees, but also of architects who sometimes come across

very exacting clients, who not only want occasionally a £100 job for half the money, but will put an architect to the trouble of drawing, and redrawing, until it is brought back bit by bit to the point where he has probably been told at the start that could not be exceeded for the proposed expenditure. On the other hand, I have heard of architects, and some of them whose work has been hung in the Royal Academy, being content to supply builders with the flimsiest plans to one-eighth scale, partly drawn, some portions to scale and others not, with no specification nor detail drawings, and then expecting their 5 per cent., which is not fair to either the public nor to their professional brethren, as it tends to bring architects and their work into disrepute. And in the question of personal supervision, I have heard of cases of really large works of a national character, where the architect has been seen on them only at intervals of six months.

METROPOLITAN IMPROVEMENTS.

On occasions of this sort I am expected, I believe, to have something to say, and only on subjects that directly concern the Society, but also generally upon what is going on around us, and naturally the first place to which I turn is this great Metropolis, the largest in the world, but by no means the best laid out, the handsomest, nor at all what it might be if improvements were all taken up here in the same bold and unhesitating way that they have been in Continental capitals like Paris, Vienna, Berlin, Brussels, Munich, Rome, Baden-Pest, Dresden, and the many others that might be mentioned. The impression that always falls upon one when returning from either the European or American continents to London is the wretchedly narrow and unsightly-looking streets, with their low capital, and with perhaps a greater variety and originality of design. This is so; but, whatever merit there may be in these respects, is just as often discounted and almost destroyed by the juxtaposition of something just as ugly and inferior. Take the City of London. It may have some of the finest commercial palaces in the world, rivaling those of old Venice itself, but look how they are huddled together! There is positively not the space to appreciate their design, their proportions, or their detail. London from end to end gives one the impression that there is no general intelligence guiding or directing the whole.

ARCHITECTS NOT TO BLAME.

For this disappointing result of the largest metropolis in the world its architects are not responsible. Again and again have they pointed out what might and should have been done from Sir Christopher Wren's plan for the rebuilding of London after the great fire of 1666, down to the time of the late Sir Charles Barry, when he produced a comprehensive scheme for the transformation of Whitehall and a good part of Westminster. Instead of a general scheme, we have all sorts of incongruous blocks of government offices dotted about in all sorts of inconvenient positions, shapes, and sizes, just as the necessities of the hour have evolved some new requirement.

GENERAL SCHEME WANTED.

What is wanted is a general rebuilding and improvement scheme fixed after mature deliberation by a competent central authority specially constituted by Parliament, and controlled by the chief local authorities, and, perhaps, the representative societies of architecture, sculpture, and engineering, with a special regard to its qualifications and fitness for the purpose. When once a general scheme had been adopted, all subsequent rebuilding and improvement should be done in conformity with it. Then, in the course of time, London would not only be superior in size to other capitals, but rival them in appearance and beauty, and be worthy of its unique position as the centre of the most important Empire that the world has yet seen.

RECENT SCHEMES.

In saying this, however, I do not ignore the fact that the improvements now in hand in the Strand and Whitehall will in ten years' time

quite transform those localities; but these are only very small portions of what might and should be done, if this ugliness, general squalidness, and congested traffic is to disappear.

THE PROVINCES.

But I must not give my sole attention to the Metropolis. Indeed, our larger provincial cities do much more in proportion to their size and wealth than does the Metropolis. There appears to be a far stronger and more vigorous local patriotism or public spirit, and this will be recognised when we turn to what has been done during recent years, and is still doing, by such municipalities as Birmingham, Glasgow, Liverpool, Manchester, Leeds, Sheffield, Newcastle, and many others.

TENURE OF BUILDING SITES.

There is yet another practical point that I must not omit upon an occasion of this sort, that is closely allied with building operations and the development of the best construction and the highest forms in our art. I refer to the tenure of land. The leasehold system should be tolerated under modern civilisation. It is unknown on the Continent of Europe. It is unknown in the United States. It has no hold in our Colonies. Even in Spanish and Portuguese America a building owner possesses the freehold of his site before he commences operations, and so it should be here, when one of the greatest aids that has ever yet been given to good building is so completely and so well as the greatest blow that could be rendered to contemptible squalidness and jerry-building. Then the building owner would be interested in putting everything of the best, and having a structure that would not only last the lease out, but for all posterity. Because, if his own descendants did not wish to retain possession, they would be interested in having the most substantial and artistic property for sale.

EXEMPTION FROM TAXATION.

So far is this principle recognised in Austria, for example, that not only do they insist there, becoming the owners of the freehold before building, but the building owner is exempted for a fixed number of years from local taxation, in consideration of the advantage it is to the State in the fact of his putting a new building where previously there was either nothing or an old one. We can imagine what an impetus this would give to London improvement, if the same principle was followed here, instead of the opposite, which is to immediately increase a building owner's assessment with every improvement he makes. Needless to say, with freehold tenure and relief from taxation upon improvements, in Austria we find some of the best buildings in Europe, whilst in England, where the converse obtains, we find some of the worst.

PROSPECTS OF THE PROFESSION.

In conclusion, let me say, however, that I am still a great believer in the destinies of our country; that these and other obstacles to real progress will, by common consent, in course of time be removed, as there have been others of equal importance, and that to the careful plodder in architecture, as in the other liberal professions, there are prospects still before us as good as any that have been enjoyed by our predecessors. Our watchwords should be education, qualification, and registration, and by a strictly conscientious attention to our duties we should be sure to merit the respect, the confidence, and the esteem of our clients, and the public generally, for we must remember that whatever we build cannot be hidden, and will stand permanently in evidence for or against us, long, long after all that are now in this hall have passed away and are otherwise forgotten.

BRITISH AND IRISH BUILDING STONES.—XXXII.

EDINBURGH.

THE rocks in this county are Coal Measures, Millstone Grit, Carboniferous Limestone, Calcareous Sandstone, Upper and Lower Old Red Sandstone, Silurian rocks of Llandovery and Carnaroe age, and Basalt. Edinburgh is built on Calcareous Sandstone, Old Red Sandstone, and Basalt. Dumbarton, Coal Measures, Leith, Alluvium, Calcareous Sandstone, Musselburgh: Coal Measures and Alluvium. The extreme south-east of the county is occupied by Silurian rocks; the Moorfoot Hills being of Llandovery age, and

these forming the foot of the hills to the county boundary are of the age of the Welsh Llandovery rocks. To the north-west of these hills the Carboniferous rocks succeed each other, every member of the series being represented. Old Red Sandstone is found in the Pentlands and Braid hills, occupying an insignificant area, as compared with the Carboniferous rocks. The building stone of the city and county is Calciferous Sandstone; but this is not so extensively used as it was formerly, owing to many of the prime quarries having been worked out, and the introduction of New Red Sandstone from Dumfriess and other counties. On the whole, it may be said that this latter is not as good a weather stone as that which it has supplanted. The Coal Measures extend south from Musselburgh, and they yield stone used locally only for rough walling and dressings. Immediately underlying the Coal Measures is the Millstone Grit or Moor Rock, which consists of white and grey sandstones, coarse grit, and coal seams. The Coal Measures are quarried for sandstone at Pinkie, Musselburgh, and the Millstone Grit at Polton, Bonnyrigg, Mr. K. Kitchen; and Millstone Grit at Brown, Mr. Thompson. The latter of these rocks are extensively used for building, the three quarries named giving employment to only twenty men. The Carboniferous Limestone series consists of sandstones, shales, coal, ironstone, and bands of crinoidal limestone, like that of Yorkshire, and the central plain of Ireland, but they develop to anything like the same extent. The Limestone quarries are Espersstone, near Gorebridge, Messrs. Mitchell and Sons (52 men); Torphain, West Calder, the Coltness Iron Co., Ltd. (25 men); Magazine, Cranston, Mr. C. P. Rathgate (10 men); Middleton, North-ridge, Mr. W. T. Rathgate (8 men); and Camps Lineworks, near Wilkinston, Messrs. Wood and Co., Ltd.

The Carboniferous Limestone rocks rest on the Calciferous Sandstone series, and this consists of white and grey sandstones, black and blue shales, cement stones, limestone, and occasional coal-seams, all of which pass down through red and purple sandstones, conglomerates, and concretion stones, and Old Red Sandstone, which they are distinguished by a slight difference of colour. The upper sandstones, shales, cement stones, and limestones vary considerably in thickness, being in some places several hundred feet, and in others entirely absent. The shales are highly bituminous, and are extensively worked for paraffin-oil, and some building stone from the beds of sandstone lying immediately under the shales. The most celebrated quarry in the county is that at Craigleith. Numerous houses and public buildings were built with this stone during the end of the 18th and the first half of the 19th centuries; in fact, the quarry, which covers an area of about 300 ft. in length, in places, yielded for several years almost all the stone used in the City of Edinburgh, and it is still considered to be one of the best building stones in the United Kingdom. Over 98 per cent. of the Craigleith stone is silica, with about 1 per cent. of carbonate of iron, and traces of iron and alumina. Enormous stores were raised in this quarry, one cut out in 1823 measured 136 ft. by 20 ft. by 8 ft., and weighed 1,500 tons; part of this block was used in the Calton Hill Monument, and some was sent to Buckingham Palace, London. The quarry is supposed to be worked out—or, at least, to be nearly so—the best building stone, that was used in the burning of the city, and the rubble masonry. Mr. J. B. Bess is the present quarry owner, and he employs about 40 men in it. The three quarries at Granton are also in the Calciferous Sandstone; they were once extensively worked, but are now closed, the sea having broken in and ruined these measures. 185 ft. long and 5 ft. in diameter at the butt. The pier and breakwater at Granton are built of the local stone, as also the Watt statue. The most extensively-worked Calciferous Sandstone quarry in the county is that at Hailes, about 2½ miles west of Edinburgh. It is worked by the Hailes Estate and Quarries Co., Ltd., who employ about 160 men. The stone is of two colours—"blue" and "white"—the latter really a cream colour; the presence of mica makes the stone rather

beddy; but, on the whole, it is a fairly good weather stone where clay lands are absent. These are occasionally found in the rock, and where they occur the stone weathers badly. Like the Craigleith and Granton stone, that at Hailes is obtained from beds immediately underlying the oil shale series. The same sandstones were formerly much quarried at Ravenshall, 1½ miles west of Edinburgh; they were fine-grained, greyish-white, good weather stones;—the unbearing is very great over the best rock. There is a second quarry at Ravenshall, known as the Quarry, which yields a fine, hard, dark grey stone; only 11 men are now employed in these quarries. Barron Park Quarry, Craigmoad, worked by Messrs. Cousin, is in the Calciferous Sandstones; it gives employment to 22 men. There were many quarries of importance in the Calciferous Sandstone rocks around Edinburgh, and these once much worked for buildings in the city; but the best stone having been used up, the quarries have been abandoned. Amongst these were Craigmill, which furnished a reddish sandstone, very hard and full of pebbles. This was used in building the docks, Rathall, near Slatford, the stone quarried here was of a reddish colour; some beds of white were also worked; but, owing to the presence of iron in the stone, these became discoloured when exposed for a time to the atmosphere. Hermand quarry is in the oil shale series. The rock is massive, hard, and compact; though 95 per cent. of the material of which it is composed is silica, it is not a safe weather stone. This is probably owing to the presence of carbonate of iron and alumina, to the extent of about 5 per cent. Mr. G. Craig, in a paper read before the Edinburgh Geological Society, says of this stone, "it is an excellent building material," the quality appears to be of a reddish colour; it was used in Calton Jail (1866), in which there are occasionally black marks; "at Pillars, in Meadows (1888), it shows signs of weathering"; and at Free St. Andrew's Church, Drumshugh-gardens, "it is satisfactory." Currie Glen quarry near Northwick is also in the Calciferous Sandstone. It is a grey, medium stone, fine-grained, containing nearly 98 per cent. of silica. From the foregoing detailed description of the Calciferous Sandstone quarries in this county, it will be seen that this sandstone was at one time the chief building stone of the county, and the best beds having been worked out, or having become too expensive to work, owing to pumping and unbearing at great depths, similar stone from adjoining counties, and New Red Sandstone were imported to supply the demand for an easy working weather stone. At Rusha, near West Calder, a stone, locally called Lakestone, is quarried by Mr. Reid for even-sole, and the Carboniferous Limestone quarried at West Murieston was used as marble in and about Edinburgh. The Old Red Sandstone and Silurian rocks on the south coast of the county are not extensively quarried, and where they are worked the stone raised is for local use only. Whinstone or Basalt is extensively quarried at Eweland, Ratho, Blackford, Leony, and other places. It is chiefly used for road-metalling. The Basalt of this county is of all ages, from Old Red Sandstone down to Miocene time; the Pentland and Braid Hills, consist of Old Red Sandstone with carboniferous layers 4,000 ft. to 5,000 ft. thick. The Carboniferous rocks for miles round Arthur's Seat are full of traces of contemporaneous volcanoes, consisting of ashes and lava streams, which were ejected from numerous volcanic vents. The basalt of Arthur's Seat is again more recent than that of the Lower Carboniferous rocks, and the lava flows are of the same time as that found in the Coal Measures, which was thrown up during the deposition of the underlying Permian strata. Newer than any of these lava streams are the numerous trap dykes, which traverse all the other rocks, running east and west. Basalt or whinstone was, of course, at one time melted lava, and the amount of this material found in the Old Red Sandstone Rocks exceeds that of the entire Silurian system. The latest masses of basalt erupted in these islands belong to the Miocene period, and in Mull there are successive sheets rising to a height of more than 5,000 ft. in thickness not being known, as they disappear under the sea, and the topmost layers have been removed by denudation.

ELGIN.

The rocks in this county are Triassic and Permian Sandstones, Old Red Sandstone, with impure limestone, Dalradian schistose, and

gneissous rocks, Basalt, Elgin is built on Old Red Sandstone and Alluvium. Forres and Forchabers Alluvium overlying Old Red Sandstone. The south and centre of the county are Silica Schists, Gneiss, and Quartzites of the Dalradian Central Highland Crystalline Series. Old Red Sandstone extends from the River Spey on the east to Lothian Hill on the west. Between Elgin and the coast from Lossiemouth to Burchard Triassic rocks are found. Formerly these red rocks north of Elgin were classed by Murchison, on purely lithological grounds, as "Old Red Sandstone," but the discovery of a reptile, now called *Hyperodon*, Gounin, in them induced Huxley, on biological grounds, to class the rocks as Triassic. The discovery of several other reptiles in these beds has settled the matter beyond all dispute, and the Elgin Sandstone in this locality is now classed with the other reptile-bearing strata of Great Britain. It may be explained here that no more highly-organized creature than a fish has been found in any Old Red Sandstone rock, and that reptiles had not made their appearance in the world during the deposition of that formation, their first appearance being in the New Red Sandstone which overlies the Coal Measures, on this district the latter are entirely wanting, and the New Red Sandstone is absent from the stone, without any line of demarcation whatever. There is no change of dip, colour, or texture at the supposed point of contact, or any evidence of denudation, though millions of years must have elapsed between the deposit of the two formations, while great lapse of time is to be marked here. Even as there are still believers in the fact, so there are geologists who still hold that the reptilian sandstones of Elgin are Old Red. The quarries in this Triassic sandstone are Newton, Mr. G. Geddes (33 men); Oakbrae, Mr. D. Forsyth (19 men); Rosebrae, Mr. D. Reid (11 men); Crowhead, Mr. P. McLean (10 men); Spynie, Messrs. Davidson and May (9 men). There are two other quarries at Spynie worked by the County Council, and Elgin Burch Road Trustees, Cuthillslock. Mr. A. Garrow (5 men); Mainsaugh, Mr. G. Geddes (5 men); Millstone, Alves, Mr. A. Reid; Morriston, Mr. P. McLean; the Redhall, Mr. J. Muirhead. Basalt is quarried at Dulaig and New Forest. It will be noticed that there are no Carboniferous rocks in this county.

HOW TO ESTIMATE; OR, THE ANALYSIS OF BUILDERS' PRICES.—XXXI.

By JOHN T. REA, F.S.I., Surveyor, War Dept.

IRON FOUNDER.—(continued).

ANALYSIS.

THE elementary differences between wrought iron, steel, and cast iron are:—

Wrought iron contains little or no carbon, not exceeding 0.25 per cent.
Steel a small percentage, from 0.15 to 1.8 per cent.
Cast iron a large percentage, from 2.0 to 6.0 per cent.

Wrought-iron articles are usually specified to be manufactured from iron equal in quality to best Staffordshire, and approved by the architect before fixing; to be forged clean from the anvil, and neatly, soundly, and perfectly finished.

Steel is now generally substituted for rolled iron, especially in joists, on account of the greater strength embodied in smaller size, and being more serviceable in every way. Also, being little more in cost, it is obviously more economical to employ than wrought iron. The most reliable process for the production of steel of a high-class uniform quality is the Siemens-Martin open-hearth acid process.

Cast Iron is divided into "grey" and "white." The former is made from foundry pigs containing a large proportion of free carbon, the latter from forge pigs, which contain very little free carbon. A mixture of grey and white is called "mottled" cast iron. The usual description is that cast-iron articles are to be of good soft grey iron from the second melting (and not run direct from the blast furnace), cast sound and clean, and subject to such tests as may be required by the architect.

Casts of best quality for smith's work come from Wales, and are screened before being used. It is hard and anthracitic, but gives out great heat. A sulphurous coal injures the quality of the iron.

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Iron pipes can be obtained in lengths from 20 ft. to 30 ft. long, and up to 12 in. by 3 in. by 1 in. in section. Iron pipes are rolled up to 16 in. deep and 10 in. length. Iron pipes of any thickness from 1/2 in. to 1 in., less than 1/2 in. being classed as sheets. Plates may be obtained up to 4 ft. wide, 15 ft. long, and 1/2 in. thick, and sheets up to 3 ft. wide and 15 ft. long, 2 ft. 6 in. thick.

The following is a table of the ordinary prices at which steel can be rolled without extra charge.

Dimensions.	Flat.	Round.	Square.	Angle.	Tees.	Channel and Joist.
Up to 10 in. by 10 in.	10	21	35	50	36	36
Up to 12 in. by 12 in.	18	41	66	101	72	72
Up to 14 in. by 14 in.	26	59	94	139	108	108

A great variety of other forms can also be obtained on iron and steel.

PRICES.

The basis of all pricing of iron and founder's work must be the weight of the article, and when this is ascertained the comparative values of the labour on them are easily adjusted. It is essential to obtain prices for all ironwork direct from the founder or smith when there is any quantity, as the market fluctuates a good deal. The various quantities likewise cause great differences in cost. The price of good ordinary iron in England is about 10s. 6d. per lb.; and the cost of the Farley's brand of best Yorkshire is 2d. per lb. The latter, being tough and ductile, allows of greater facility in working, and so proves cheaper in the end for superior work.

Although ironwork generally is billed at per weight, small articles are quoted by number, and such articles as pipes and gutters by the foot run. Where patterns are plain they are often in stock, and are then included in the price quoted, which should be "delivered on site." Prices for London estimates will be 1s. to 1d. per cwt. more than country castings. Rolled iron joists are billed at per cwt., but small joists up to 3 in. deep and large joists should be kept separate, and it should be stated whether hoisting is included or taken separately. Add 5 per cent. of the total weight of riveted girders for weight of rivets at the usual 4 in. pitch.

ADDED BY MARKET PRICES.

Per ton. Prev. Trlb.

Belgian Iron in France, Belgium

Belgian Steel in France, Belgium

Belgian Iron in France, Belgium

Belgian Steel in France, Belgium

Belgian Iron in France, Belgium

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Belgian Iron in France, Belgium

Belgian Steel in France, Belgium

fact with three 1-in. stout screws, including drilling and counter-sinking in iron for dipping. The latter method, however, is for moulded gutters, with a vertical side. The analysis is also similar to rainwater pipes.

6 ft. sin. half-round gutter at 10d. per yard 8 4
2 brackets at 28s. per set 0 11
Gutter bolts and rivet-end cement 0 10
Labour fixing, 1 hour south 0 10

Add 10 per cent. profit 1 4

Cost per foot run 63 9

Cost per foot run 0 73

Add *Extra to Last for Angles*.—Take an angle as 6 in. each way, or 1 ft. total length round. Then as swan-necks:—

Cost of angle for 1 ft. u.n. gutter 8 4
Deduct cost of 1 ft. of gutter 0 11
..... 0 73

Extra fixing and bolts, &c. 0 6

Add profit 0 1

Cost of each, extra only 0 10

Add *extra for Nozzles or Outlets*.—The nozzle is cast on to a small piece of guttering 1 ft. long. Therefore—

Cost of nozzle length of sin. guttering 8 4
Deduct cost of 1 ft. of guttering 0 11
..... 0 73

Extra fixing, and bolts, &c. 0 6

Add profit 0 1

Cost of each, extra only 0 10

Cooking Tank.—It takes two men four days of 10 hours, or 84 hours, to cook a 5,000-lb. cast-iron octagonal tank, supplied by Messrs. Douglass, Blaydon-on-Tyne. Each tank comprises nine bottom plates, and 16 side-plates in two heights, of 3 in. metal, the total standing 7 ft. high and 12 ft. across. The weight of the tank complete is 12,950 lb., and it is supported on a brick or concrete base. To form the rust-joints, level, & swarf (iron filings, salammoniac, and sulphur are required, also 160 lb. of screwed bolts and nuts.

(To be continued.)

THE FINAL REPORT OF THE LOCAL TAXATION COMMISSION.

A PAPER summarising the findings and recommendations of this important Commission was read on Monday evening last, at the ordinary general meeting of the Surveyors' Institution, by Mr. A. Dudley Clarke, Fellow, who, while fully conscious of the difficulties attending the making of any summary of such a comprehensive report within the limits of a sessional paper, endeavoured, as he said, to review the main principles of the proposals. The terms of reference to the Commission were: "To inquire into the present system under which taxation is raised for local purposes, and report whether all kinds of real and personal property contribute equitably to such taxation; and, if not, what alterations in the law are desirable to secure that result." With this object in view the Commission examined no less than 82 witnesses, and the result of their labours was the publication of eight volumes of evidence and memoranda, in addition to three reports. Two further reports dealing with Scotland and Ireland were promised. It was scarcely to be expected, from the nature of the subject, that there should be unanimity among the Commissioners, but, however, were in substantial accord upon several important points. The majority report, signed by Lord Balfour of Burleigh and 11 out of the 15 members of the Commission, was qualified by reservations on the part of some of the Commissioners, and there was also a separate report on urban rating and site values by the chairman and four members, and still another by Judge O'Connor, who dissented from all his colleagues. In the result, the majority reported that their deliberations had been "prolonged and laborious." The Commissioners divided the funds raised by taxation for local purposes into 11 rates, and 2 sub-ventions from the Central Government, Chapter I. on rates was descriptive of the rating system generally, and contained a reference to the property liable, and described the basis of valuation under the Parochial Assessments Act, 1838,

and the Valuation Metropolitan Act, 1869. A few of the principal spending authorities were given, and the exceptions mentioned to the rule that all properties should be rated at their full value, land, tithes, railways, &c., being rated at some portion and agricultural land being assisted by a grant from Imperial sources. The subdivisions were next described, and the important changes made in 1888 and after by the discontinuance of grants and the substitution of assigned revenues, which were briefly: 1. The License Duties, 2. The Death Duty Grant, 3. The Beer and 8 sh. 6 d. Duties. These were paid to the Local Taxation Account, and the main part of them apportioned between the administrative counties and the county boroughs. The receipts and payments to the local authorities, in respect of the assigned grants, amounted to nearly 7½ millions for the year 1899-1900, with a further contribution from the State of 1½ millions for the Estate Duty, being equal to an average rate of 1s. 1d. in the £. The second clause of the reference, directing the Commission to inquire whether all kinds of real and personal property contributed equitably to local taxation, was then dealt with. On the question whether persons or property contributed the majority report expressed no opinion, while the minority held that persons, and not property, contributed; but they thought that this was a legal, and not a material, distinction. The majority report could not hold that rates were burdens on real property, and thought it "unfathomable" to rely on rates showing the amounts of taxes raised in respect of real and personal property respectively; but while holding that the grievances of ratepayers could not be accurately or usefully expressed by any precise formula, they by no means asserted that these grievances were imaginary. The majority report, discussing the incidence and equitable contribution, regarded the point as exceptionally obscure as between occupiers, owners, and other persons, and agreed with Mr. Goschen that rates and taxes which fall upon the occupiers of a dwelling-house were a burden upon the consumers of a property "called a house," rather than in respect of the property. The minority report summed up the ratepayers' grievances thus:—They claim that they are unduly burdened for services which are of national rather than local importance; that taxation levied exclusively in respect of immovable property operates unfairly, as the burden on particular trades and industries is abnormally heavy. Large measures of relief have been given; but the result is not satisfactory, the owners of urban land being said not to contribute adequately. In both the reports the Commissioners recognised that there were insuperable difficulties in solving disputes on an impartial, and equitable, or statistical or any similar basis. But in order to test the reality of the grievances it was necessary to consider what services for which the rates were used were national and onerous, and what were preponderantly local in character, or directly beneficial to the ratepayer or his neighbourhood. The Commissioners believed that the "National" services, such as police, education, asylums, valuation, vaccination, and some others, should remain under local control, although the transfer of the prison service some years ago was admittedly successful. The idea of a "National" tax, or a direct contribution from the Exchequer or the extension and development of a tithe system, was rejected, which had been in existence since 1889. A table was given showing that 83 per cent. of the entire local tax revenue was collected by a single tax on rateable property, but such a table must be used with care, as it took no account of the volume of property or the aggregate value of the tax system. The system charged. Reference was made to Imperial grants given before 1888, and Mr. Goschen's scheme of reform in that year was described, its essential feature being the discontinuance of the system of grants-in-aid and the establishment in lieu thereof of a local taxation system by means of which certain items of taxation, out of which fund payments were made in aid of particular services. This scheme they thought was based on sound principles; but although the majority desired that it should remain, they thought it might be modified with advantage. The con-

ditions involved in the appropriation of the revenues were also sketched, and were attributed to a large extent to the changes made in the Act of 1888 during its passage through Parliament. The majority surmised that as the central authority must continue to collect some of the sure-money revenues, it should also ensure their expenditure. After dealing with the transfer from Imperial to Local Finance of a number of the Prolate Duty in 1888, the report did not consider that the reform had gone far enough, because not more than 6 per cent. of the increased local revenue was levied in respect of non-rateable property, and it was suggested that the Local Taxation Licenses might be looked to for placing local finance on a sound basis. It also had been suggested that instead of the present subsidies the Inhabited House Duty should be given to local authorities. The Commissioners came to the conclusion that the system of Exchequer contribution accounts should be abolished as too complex, and involving an elaborate system of adjustments and much unnecessary overlapping. It was also suggested that adjustments between counties and boroughs might be found necessary. The result of the London and the Commissioners' proposals would be that charges now borne by the ratepayers of London as a whole would be in many cases met by Imperial grants. In effect a portion of the contribution of local taxpayers for national services would be repaid, but a larger portion than hitherto—nearly one-half—while the balance must be locally borne by the ratepayers. The next deal with the apportionment of the rating burden between various classes of ratepayers, and suggested that for all burdens which are of an onerous character, and for the cost of the maintenance of highways, agricultural land should be assessed at one-half its value, and in respect of other burdens at one-fourth, as heretofore. Clerical tithe should have the same treatment, and land, railways, and canals should be assessed at one-fourth for rural, sanitary, and urban district rates. In the case of shops, factories, and other industrial properties, no alteration in the law was considered desirable. The rating of land values was considered neither practicable nor desirable, except by some members of the Commission who signed a separate report dealing with this point. The difficulty of valuing gasworks, mines, railways, &c., in the absence of any uniform system among the unions, was referred to, and the report of the majority ended with a recognition of the services of the staff attached to the Commission. Mr. Dudley Clark next pointed out the different matters on which Lord Balfour, Sir E. Hamilton, and Sir C. Murray differed from their colleagues, although in general concurrence with their conclusions, and added many valuable statistics in the form of appendices to his paper, which, however, are too voluminous to quote here.

A vote of thanks having been proposed and seconded, was put to the meeting by the chairman, Sir John Rolleston, M.P., and heartily agreed to.

Among the list of receiving orders in Friday's *Gazette* the name appears of Lewis Frederick Shove, of Bristol, as receiver of the Exchequer.

The Colne and Holme Joint isolation hospital committee have decided to apply for powers to borrow £24,100, the cost of the proposed hospital at Meltham Moor, which is in addition to the cost of the site, £500.

Recently tradesmen have been engaged repairing some of the masonry of the north side of Littleton Palace. Chief among these have been the wall on the north side of the quadrangle, and the apartment known as Queen Mary's room, where the old hotels have been replaced by new ones. The ancient fireplace has also been strengthened by the erection of angular iron or iron tiles. Repairs of a more or less important nature have been effected on other parts of the palace, and also in connection with the lock harbour.

A mural monument to the memory of the late Lord Hatherston and his wife has been placed in the chancel of the parish church of Penkridge, Staffs, by the members of the family. It consists of a slab of Carrara marble set in a framework of Purbeck alabaster. The design is in the style of the Italian Renaissance, and is enriched with shield bearing the arms of Littleton impaling Percy (the coat arm of the late Baron H. Hatherston) and his wife. The monument is the work of the sculptor, of Leichfield, and occupies an appropriate place in the chancel, which contains some fine monuments of the Littleton family, some of them dating as far back as the 13th century.

OBITUARY.

The death of Mr. FREDERICK WILD, architect, of Bradford, occurred at his residence, 10, White Horse, on Friday night. The deceased, who was a native of Halifax, came to Bradford with his father in early youth, and was articled to Mr Samuel Jackson, J.P. He was afterwards assistant to Mr W. J. Morley, F.R.I.B.A., Bradford, and on leaving his office, some seven years since, commenced a private practice in his native city. Among the best buildings of which he has been the architect is the Bradford Congregational House, in course of erection at a cost of £40,000 for the corporation, and illustrated by us in our issue of Feb. 8 of this year; the East Ward Conservative Club; and the caretaker's lodge at Claxton Heights, which is considered one of the best examples on a small scale, of a Pluralist Hall. Mr. Wild was a bachelor, and was only 49 years of age.

CHIPS.

Mr. Ellis Marsland, the Master of the Tylen's and Bricklayers' Company, and honorary secretary of the Society of Architects, will read a paper on the work of the British Fire Prevention Committee before the Insurance and Actuarial Society of Glasgow on Monday, 9th prox.

Twelve artisans' dwellings have been erected on the field-road, Claxton, near York, by the corporation, at a cost of £2,000, and it has been decided that the rents shall be fixed at 1s. per week. This will yield £24 16s. per annum, and, including 3d per cent. on the outlay, the annual expenditure will be £24 13s. 3d. These include rates, taxes, insurance, repairs, and a ground rent of £17 per annum. An estimated loss of £29 18s. 3d. was shown on the rentals, and, adding £50 5s. for repayments of capital at interest, the annual charge to the rates is expected to be at least 1s. 3d.

Mr. Frederick James Edge, assistant city engineer to the Liverpool Corporation, has been appointed to the post of engineer at a salary of £1,000 per annum, by the Newcastle-on-Tyne City Council, in succession to Mr. Laws, resigned. Mr. Edge received 30 votes, as against 20 for Mr. H. J. Swindlehurst, engineer, Bristol, 15, and Mr. H. J. Swindlehurst, city engineer and surveyor, Coventry, 3. The salary offered is £1,000 a year, and a property surveyor was also appointed at £500 per year, while a further £500 will be paid to Mr. Laws as consulting engineer.

The new buildings, comprising the Rhyol County School, were formally opened on Wednesday week. The school is situated in Grange-road on a site of four acres. It is a dual school for boys and girls, with a accommodation for 150 pupils. The total cost of the building was between £5,000 and £6,000.

The additions to the Brentford Union Infirmary, Isleworth, are being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke-flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

At the London Sheriff's Court, Mr. Under-Sheriff Turbell and a special jury heard a claim for compensation brought by Messrs. Cole, carriage builders, of High-street, Kensington, against the council in connection with Kensington improvement. The jury awarded the claimants a sum of £23,000.

Lord Justice Cozens-Harley on Saturday afternoon laid the foundation-stone of the People's Hall, which is being erected in Latimer-road, Notting Hill. In the new hall, which will cost about £150,000, the bronze will be provided for boys and girls, besides a series of class-rooms.

The Bishop of Exeter opened, on Friday, the new parish-hall of St. Simon's, Plymouth, one of the seven new churches to be built. Only the large hall has been completed, and to it classrooms and a temporary church. It is built of red brick and Bath stone dressings. Internally, the roof is of barrel shape, with circular ribs springing from stone corbels and divided into compartments by moulded wood-block floors. 375 chairs can be used. For porch purposes, 100 chairs can be used. The architect is Mr. Harbottle Reed, of Exeter.

At the London Auction Mart, Tokenhouse-yard, E.C.4, on Monday, Hogarth House, Chiswick, for many years occupied by William Hogarth, was sold for £2,500, the precise sum named by the committee who had previously sought to raise subscriptions for its preservation as a memorial. The property, including half an acre of garden, in which still stands the famous mulberry tree, is a copyhold of the present manor of Chiswick, and was presented to the London district council of Chiswick by Mr. J. Passmore Hill, and placed in the Chiswick Town Hall, was unveiled yesterday (Thursday) by Sir W. B. Richmond, K.C.B., R.A.

PROFESSIONAL AND TRADE SOCIETIES.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.

The council of this body have had under discussion the designs of proposed new buildings at the Castle, recently exhibited in the City Chambers. After having inspected the plans, the site, and the probable effect from various points of view, they resolved as follows:—"The council feels most strongly that a site of this commanding position demands the most careful and skilful consideration, and although it is evident that no little attention has been directed to the preparation of the designs, the council observes with great regret that from any point of view the outline of the great mass of the Castle and its buildings will be destroyed; and, further, that the general designs do not commend themselves as being in harmony with the better work on the Castle Rock. The council trusts that, as this question is one of very great and permanent importance, nothing will be done without further serious consideration."

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CHAFTSMEN'S SOCIETY.—The usual fortnightly meeting of the society was held on Friday, the 22nd inst. Mr. James McKissack, president, in the chair. The subject of the evening was "Foreign Competition in the Building Trades," was read by Mr. Geo. Herbertson, measurer. The essayist held that the restrictions put by the combined action of workmen on the importation of foreign-made joinery, finishings, and the like, was contrary to spirit of free trade, which is the policy of this country. He suggested that for rolled steel beams and Portland cement a certain standard should be specified, and let the material come from where it might. He deprecated the proposed boycotting by slate quarry masters in their attempt to keep out foreign slates. The paper proved to be of exceptional interest, and was treated in a manner calculated to dispel any tendency to narrow views on the subject. A hearty discussion followed, opened by Mr. John Fairweather, A.R.I.B.A., and the thanks of the meeting was cordially conveyed to the lecturer.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

The first meeting of the winter session of this society took place on Thursday, the 21st inst., at the Queen's Hotel, Leeds. Mr. Butler Wilson, president, occupied the chair. During the evening the prizes were distributed to the successful students. For the best measured drawing work the prize was given to Mr. S. D. Gibson, of the Leeds City Institute. Mr. S. D. Gibson, formerly assistant with Mr. Bowman in Leeds, and now of Chorley, in Lancashire, four prizes, making a total of 11 guineas, were presented. A letter was read from Mr. George Corson presenting to the society the portrait of himself which had been given to him by the governors of the society. Mr. Corson said the society's first president, who had been founded 25 years ago, and it is partly in commemoration of that fact that the painting, which is by Mr. H. Willson, was subscribed for. The gift was gratefully accepted. The President, in his inaugural address, said the council of the society had suggested that in the event of the Leeds Queen Victoria Memorial Committee deciding to place the proposed monument in Victoria-square the area of the square should be increased, and that an architectural laying-out of the square form an inseparable part of the scheme. A resolution to this effect had been forwarded to the Lord Mayor, and there was every reason to hope that it would receive consideration.

He would say that in these days of accumulation of material things the great requisite for success was enthusiasm. The means of education to-day opened out a path by which students might follow in the footsteps of the authors of the greatest architectural achievements. Dealing with the progress and outlook of the profession, Mr. Willson said that any student who studied in his country 20, or even 10, years ago would be amazed on his return at the changes that had taken place in our towns and cities. "Rebuilding had been going on by leaps and bounds, and it would do so yet more radically. Already the principal streets of our cities were overcrowded and almost impassable, and the necessity for rebuilding was suggested on all hands. In this wholesale reconstruction they saw the danger of uncontrolled action. Most of the reconstruction seems to have been carried out without plan or system, or any consideration for the ultimate development. No thought is given for providing great arteries of communication from centres to out-

lying districts; architectural treatment is uncontrolled; owners and builders seem to have had carte blanche for negligence. These conditions ought to be effectively dealt with, and that schemes should be prepared for the probable and ultimate development of our cities and towns consequent on their rebuilding, present sites for future public buildings being carefully selected; that provision be made for subways; and that the insanitary areas be cleared in accordance with such schemes; so that the whole may be homogeneous as well as conglomerate." The formation of County Councils in place of rural and urban authorities was resulting in the erection of public institutions, courts, hotels, hospitals, and asylums. These designs were often inadvisably obtained by competition, perhaps a clumsy and costly means of obtaining the best results, and certainly very costly so far as the profession of architecture was concerned. Mr. H. Perkin proposed a vote of thanks to Mr. Wilson for his instructive address, and Mr. W. H. Thorp seconded.

LIVERPOOL BUILDING MATERIAL TRADERS ASSOCIATION.—The first annual meeting of this association was held at the Common Hall, Hawkins Hoy, Liverpool, on Monday. The chairman (Mr. John Evans) presided. The report of the committee, which was read by the secretary (Mr. H. D. McAnslan), stated that the operations of the association during the year had fully justified its formation. Representations had been made to the manufacturers upon the question of merchants' terms, and efforts had been made to induce them to regard merchants only as the distributors of building materials, and in connection therewith other associations of builders' merchants had given their active co-operation and support. A uniform list of prices for building material had been considered, and a list of retail prices for various articles had been agreed upon and adopted by the members. The officers and committee were then elected as follows:—President, Mr. John Evans; vice-presidents, Mr. W. H. Brown and Mr. Joseph Parr; treasurer, Mr. Frank Jones; committee, Messrs. John Bowler, James E. Board, W. Bowring, W. H. Dowler, C. H. Edwards, A. J. Pilkington, and F. Wilkinson.

MANCHESTER SOCIETY OF INCORPORATED ARCHITECTS.—The annual dinner of this society was held on the 21st inst., in the Queen's Hotel, Piccadilly, Manchester. The President, Mr. Alfred Darvishy, who occupied the chair, submitted "The Institution of Architects." That institute, he said, some years ago occupied an unobtrusive position among the institutions of the country. Now it was respected throughout the length and breadth of the land. Mr. Emerson, the president, had recently told them that with allied societies their numbers reached over 3,000, and that their actual members were about 1,700. They were the 400, or 500, or 600, or 700, or 1,000 probationers. Much of the progress made was due to their president, who had occupied the chair for three years. If they carried their mind back 10 or 15 years they would remember that his drawings were selected as for excellence for the Liverpool Cathedral. But a new committee was formed, and now the cathedral was to be built on a new site. The dictum of the committee was that the cathedral must be Gothic and nothing else; but owing chiefly to representation from the Architects' Society that bar had been removed. That was a point gained; but, unfortunately, their president was not going to complete again. Mr. Wm. Emerson, in replying said that he was sure that the architects of the future hoped that the genius of the country might produce a completely new style. Such remarks were calculated to do an enormous amount of harm, and cause deterioration in the architectural profession—for this reason, there was no doubt, great striving after originality at the present time. He saw that there was a danger which he principled not to see, and that danger was, that the high, that was a new sort of proportion, which those who were inspired to the best class of work did not understand. Then there was the "art nouveau," of which some examples had been seen in a town some miles north of Liverpool. The impression it made on the few weeks ago. The impression it made on the public mind was a new sort of proportion, which had gone on before. If they really wished to make great architects they could not do better than start with precedent of the best sort, and adapt it to modern requirements. Individualism, purely and simply could not be great. He would quite sure no honourable architect would allow his builder to be mulcted heavily from a combined

much oftener be placed "in the body of the church." Street advocated this years ago in his suggestions for completing St. Paul's Cathedral, and he ventured to say he was right, and that the high altar being placed at the junction of choir and nave, St. Paul's would have looked more "furnished" than it is ever likely to do as things are.

In many a large parish church the altar might similarly be brought forward, instead of banished as far from the people as possible.—I am, &c.,
A. T. K.

KEW COWL TESTS.

Str.—As the Sanitary Institute have not answered the queries contained in my letter published in your issue of the 15th inst., it must be assumed that they prefer to allow the question of the cowl patents held by them to drop. Of the wisdom of this course in the face of the absolutely unanimous condemnation of the tests, and the report, which has appeared in the Press, of which the following extracts are fair specimens, the responsible officials of the Institute are of course the best judges.

(a) "It is a significant fact that this would-be scientific report recommends the patent for efficiency to a cowl or terminal of which the Sanitary Institute themselves hold the patent—a result which was not very difficult to attain when the method of experimenting was exactly such as to favour the cowl in question, or the open-pipe principle."

(b) "I may, however, be said that they have done too much. The test of simply laying down the lines upon which, as an outcome of the tests, it was advisable to construct these cowls and to show what should be avoided on the one hand and what should be provided on the other, in order to give the best possible results, they have given their *imprimatur* to three specified models, which they have patented."

(c) "The public do not like that kind of thing. They will say: 'In order to make themselves an authority on cowls, the Sanitary Institute conducted experiments on them, and then, having taken up the position of judges, and acquired all the authority they now come into the market with a cowl of their own.' These are the things which put one against hole-and-corner experiments. . . . To private experiments nobody can take exception, public experiments everybody must welcome; but secret experiments, which are neither public nor private, but are sheltered under the guise of a scientific society, must invariably create suspicion and distrust."

(d) "A perusal of the report can only excite feelings of astonishment and commiseration in the minds of those acquainted with the facts, particularly after reading Professor Shaw's condemnation of the conclusions arrived at. . . . The tests, which have been known from Professor Shaw's investigations, that the tests for the cowls, for purposes, were valueless, and could only prove misleading and harmful. . . . The Institute has done much good work in the past, and may do still more in the future; but it must abstain from making such fatuous attempts to pose as an authority upon a subject which it is clear from the report it knows very little about."

(e) "It would have been well for the dignity of the Sanitary Institute had the tests remained unpublished."

As stated in my letter, I notified the Sanitary Institute, on the 9th inst., that their alleged "Champion" cowl was better than the cowl of an old chimney-cowl first made by me over thirty years ago, and that if they cared to send a responsible person to my office I would show him diagrams and models of this cowl, and also the identical cowl itself, besides several other modifications on the same lines, and later and more effective forms. Those who the receipt of my letter was acknowledged, no one had as yet (Nov. 25) called to inspect the cowl and the diagrams, the latter appearing in old price lists.

In large sizes, for several reasons arrived at from actual practical experience (which reasons the Institute appear to have either ignored or to have been ignorant of in their application to their cowl), I never considered this chimney-cowl good enough to make a ventilator of; and I think that the Sanitary Institute would have arrived at the same conclusion if they had made the tests with full-sized specimens, such as are used for the ventilation of buildings, instead of with models, as was done.

What surprises me most is that the Institute, and particularly the cowl-testers, should have been ignorant of the existence of this cowl, which

for many years past has appeared as a standard pattern in the catalogues of the principal chimney-cowl makers, and is to be seen on the tops of thousands of chimneys in London and elsewhere, though it is rarely or ever employed as a ventilator, cowl-makers being aware of its weak points when used for that purpose. If the Sanitary Institute had responded to my invitation to inspect this cowl, I think I would have had no difficulty in convincing them of the fact that it was by no means infallible by one or two very simple experiments, and which, I observe, were omitted to be made at Kew.

At my testing-rooms, where experiments with innumerable modifications of every conceivable arrangement of cowl and other ventilating appliances have been continuously carried on for at least a decade before the birth of the Sanitary Institute, improvements being strenuously and unrelentingly sought for, further revelation might also have been made as to how cowls should really be tested to arrive at an approximate knowledge—which at the most is all that can be attained—of their values. I need hardly say that the methods of testing employed are not such as adopted at Kew. The tests are also generally made with ventilators, and not with models, as at Kew, and which prove nothing.

It is now well over 50 years ago since my late father, as a co-worker with Professor Faraday, first practically devoted his attention to the subject of ventilation, and the natural system of ventilation which is now so generally employed in all parts of the world was the outcome of their joint labours. I merely mention all this to show that such things as ventilators and testing ventilators were known before the Sanitary Institute commenced their investigations, and that even if they the Sanitary Institute cannot rightly claim to be the first inventors of the one nor the originators of the other, as I see from the report that they do, so far as the latter is concerned at all events.

I myself may also claim to have contributed towards the elucidation of the problem of ventilation, and to have been the subject of extensive study of my life, and visited almost every corner of the country preaching the gospel of pure air, having, indeed, when so engaged, travelled seven times round the world, whilst probably about three-quarters of a million sterling has been expended in the practical development of the subject.

The Institute's secretary, Mr. Kew, which they have patented, and which is described in the report as a "Twirler"—a good scientific name, by the way—is also of hoary antiquity. In my childhood's days it used to be known as an "Old Wife," and many a weary night have I kept awake listening with awesome dread to the weird "voices of the night" as that very questionable old lady squeaked and groaned on her rusty spindle.

With regard to the Institute's third best "terminal," though it is well known that the Patent Office, with the true British commercial instinct, never refuses money, and will grant a patent for almost anything, I thought it would have drawn the line at an open pipe; but it seems that this supposition was a mistaken one, though it really does not matter, seeing that everything connected with these "prehistoric" tests—including, I regret to say, the testers themselves—has long since passed away, and can be said to be a practical entity. In connection with this, the following extracts from the Press are instructive:—

"The lapse of time has rendered most of the cowls and terminals obsolete, and beyond this the improvements and modifications that have been made in ventilators have been ignored, and a corresponding degree of scientific data are lacking for accurately determining their origin, which the present report does not supply, as it does not deal with these improved ventilators."

"They must relate to things which are no longer to be found in the same form. There are improvements in ventilators, as in other appliances, but the experiments it might be supposed the invention was to remain inactive until the report was published."

"The science of ventilation by means of cowls has progressed so much since the tests now described were made, that the varieties of cowls used in the experiments have become obsolete. . . . The help feeling that the report dealing with cowls and ventilators long since consigned to the scrap-heap and the splinter-put should not be taken seriously, although, of course, its antiquarian value need not be disputed."

"The prehistoric character of these particular experiments become more and more evident. . . . Months were passing into years, and years into decades, it tells us, 'with the work still unfinished.' . . . The date, in that respect, is as old as August, 1877, which seems now like a prehistoric period. . . . We put it only, though we were opening a book of Herodotus, or glancing at the clever ones in certain recent American journals illustrating the manners and customs of our ancestors in the Flint Age and other paleolithic periods."

"The blunder. . . . That it has no practical value may easily be ascertained. It is only for the simple reason that it does not cover the up-to-date ventilating appliances now on the market."

With regard to the actual practical value of the tests, the correctness of the methods of testing, and of the conditions governing the tests, Professor Shaw, the eminent scientist, who compiled the report, and who was called upon by the Sanitary Institute to decide upon these all-important points, expresses himself as follows:—

"In an introductory note to Part V. of the report I have given my reasons for thinking that the ratios obtained by the cowl committee depend upon the other part of the experimental arrangement, and not upon the cowl itself, and that in consequence the word 'efficiency' is not applicable. . . . It would appear that the want of agreement of the readings of the different instruments caused some hesitation about accepting a final value. All the evidence seems to have been in favour of the cowl, but the verdict was not given, and I have had to take up the difficult task of a jury and pronounce 'Yes' or 'No' upon the questions which were to be answered for the committee upon the facts they had collected" (p. 205).

"It will be well to consider briefly the conditions governing the flow of air up a pipe under circumstances similar to those prevailing at the Hut, and it will be seen that the effect of a cowl or terminal cannot usually be regarded as being completely dealt with by a single factor, or series of factors, representing efficiency, even for a single set of conditions, as to the direction and force of the wind and under which the flow takes place" (p. 340).

"The numbers so obtained for ratios of flow will accordingly not give anything which can be regarded as a 'constant' for the cowl, or which will serve to identify the effect which the cowl would produce in the way of alteration of motive force, or alteration of resistance in circumstances slightly different. The numerical result is, in fact, due to the special combination of circumstances, and could not be reproduced unless the circumstances were themselves approximately reproduced" (p. 344).

"The numbers obtained for the ratio of the flow without the pipe carrying the cowl to the flow without the cowl give us nothing that can be regarded as a constant for the cowls, and consequently the use of the term 'efficiency' to denote the ratios obtained is inappropriate" (p. 344).

This clearly endorses the verdict of the *Times* on the first instalment of the report (described as "the greatest blunder in the history of sanitary science"), which was that:—

"The method of testing was incorrect, and therefore the tests are valueless. . . . Neither in the case of either the cowl or the chimney-cowl, the true value as extractors ascertained."—I am, &c.,
ROBERT BAYLE.

64, Holborn-viaduct, E.C., Nov. 25.

Mr. Charles A. Dawson, Local Government Board inspector, has, owing to ill-health, resigned his position, which he has held for about the last ten years.

The Kent County Council have decided to build eighteen attendants' cottages at Chartham Asylum, at an estimated cost of £5,000, and also to extend the sewage filter-beds and tanks at the same institution.

The proposal of the Manchester Corporation to alter the city boundaries so as to include the whole of the urban district of Salford and a portion of the township of Duxfield, former the subject matter of an inquiry opened at Manchester Town-hall on Monday by Mr. H. H. Law, an inspector of the Local Government Board, Salford strongly opposed the proposal, and, on the other hand, are applying to the Privy Council for an independent charter of incorporation. The inquiry has been continued during the week.

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ILLUSTRATIONS.

POIN STUBSHIP DRAWINGS—BREXEN-BOND CRICKET PAVILION, NANTWICH.—HUBBERT VIEW OF AN EIGHTEENTH CENTURY HOUSE—GARDENS—PORTLEY WOOD, WAREINGHAM, SURREY.—HALL—HOUSE AT WILLEHALL PARK, BARNET.—REDBILL AND LEIGATE PRESBYTERIAN CHURCH.—THE PALLADIAN BRIDGE, BATH.

Our Illustrations.

POIN STUBSHIP DRAWINGS BY JAMES MELACHLAN.

Within From John of Gaunt's Palace, Lincoln.—Within Lincoln Castle gateway is a beautiful oriel window which formerly belonged to John of Gaunt's Palace, from the remains of which it was removed, and, having been restored, was re-erected in its present position for preservation. *Bede House, Higham Ferrers, Northamptonshire.*—This Bede-house is situated beside Higham Ferrers Church, and is a very good example for treatment in two colours of stone. The north and west elevations are given. *Acroding in the Lady Chapel, Ely Cathedral.*—The magnificent wall acroding, three ways of which are shown in the sketch, from the splendid Lady-chapel at Ely, has unfortunately received very bad treatment, much of it having been destroyed. The acroding on the east wall was entirely blown down so that the wall might be plugged for the filling of something which evidently was of more account than the acroding; but this artistic production has now disappeared, all except the plugs.

THE BREXEN-BOND CRICKET PAVILION AND CLUB, WINNINGTON PARK, NANTWICH.

DURING the past cricket season this spacious clubhouse and pavilion was opened with a gala in the park to commemorate the gift of Sir John Branner, M.P., and Dr. Mond, F.R.S. The buildings cover 12,000 superficial feet. The plan which we give with the view shows their arrangements. There are six bath-rooms, each 10 ft. by 6 ft. The dressing-rooms are 14 ft. by 14 ft. and is fitted with lockers. The reading-room

* The following illustrations of Ely Cathedral have appeared in the pages of the BUILDING NEWS—Plans, 16th, 18th, and 19th, 1881; west tower photograph, general view, July 13, 1882; west tower from North (sketch by John Johnson), Aug. 30, 1882; west tower and S.W. transept towers; National Old Medal drawings (George Marples), Aug. 25, 1882; west tower from south, with college chapel (J. D. Dugdale), Oct. 30, 1881; the lantern (full page woodcut, by R. W. Mullett), July 19, 1881; Ely's doorway, March 4, 1881; transept above Prior's Doorway, Oct. 28, 1881; two bays of nave (Geo. Marples), Aug. 25, 1882; bay of nave measured by R. W. Mullett, March 18, 1882; the crossing, under lantern, Aug. 3, 1882; interior of choir, looking west, Aug. 3, 1882; with college chapel (J. D. Dugdale), Oct. 30, 1881; West's chapel (F. J. Joass), Oct. 4, 1882; ceiling, Bishop West's chapel, Feb. 1, 1901; gates, Bishop West's chapel (J. D. Dugdale), Aug. 30, 1881; Ely's doorway, Oct. 30, 1881; reading, Lady chapel, Pugin Travelling Student's drawings (Leonard Stokes), March 10 and April 2, 1881; acroding, Lady chapel, Pugin Travelling Student's drawings (Harvey Rutherford), Sept. 22, 1882; portion of acroding, ditto; National Gold Medal drawings (George Marples), Aug. 25, 1882; Ely's doorway, March 4, 1881; Studebaker drawings (W. H. Bidlake), March 6, 1882; and the paving, Prior Crauden's chapel (J. J. Jones), Oct. 4, 1881.

is 24 ft. by 19 ft. The assembly-hall is 65 ft. by 40 ft., and is 26 ft. high, with a hammer-beamed roof over, and the billiard-room is correspondingly spacious and elaborate, 60 ft. by 30 ft. The refreshment-room is 25 ft. by 13 ft. The style of half-timber adopted is characteristic of Cheshire, and is largely used in examples so far as they apply. Messrs. Beckett and Co., of Hartford, were the builders, Mr. Cassidy was the clerk of works, and Mr. W. D. T. Munford, of Preston, was the architect. The cost was rather more than £10,000.

EIGHTEENTH CENTURY SCOTCH MANSSION HOUSE.

This bird's-eye view and accompanying plan represent an existing Scotch country house of the 18th century. It is believed to stand on the site, and even incorporate a much earlier structure erected between the dates 1555 and 1657. The treatment of the wings connected by the semi-circular passages remind one somewhat of the idea shown in the plans of the great mansion of the Duke of Portland, at Kew, of Kew, of Kew. The plan is sketched carefully to scale. The lavatory and w.c. on north side are modern additions. A. J. MEACHER, A.R.I.B.A.

PORTLEY WOOD, WAREINGHAM, SURREY.

This house has lately been built on high ground in Portley Wood, from whence it takes its name, and occupies a beautiful site of about 100 acres, surrounded by fine trees. The walls are of red brick, the upper portion being hung with tiles. The large-boards and timbering in the gables are of oak left rough from the saw. The posts of the loggia, which has a black and white marble floor, are of old oak, also is the roof of the ground floor, and used offices, a dining-room, library, and billiard-room, but no drawing-room, in accordance with instructions, its place being taken by the loggia, which commands beautiful views of the adjacent country, and is practically an open air sitting-room, and is used for several of the daily meals of the summer. Owing to the fall of the ground, there is under a portion of the house sub-ground floor, in which are situated a carpenter's shop, wine and coal cellars, larder and fruit store, and also the Grundy heating apparatus. On the first floor there are five bedrooms, two dressing-rooms, a luncheon and linen closet, bath, &c. The top floor contains four bedrooms, box and cistern rooms. The earth system is employed, the bath and other wastes being taken to a cesspool and used for garden purposes, for which there is also a tank receiving the rain-water from the roofs. The cost, including the entrance lodges, was about £2,500. Mr. E. Hewitt, A.R.I.B.A., of Buckingham-street, Strand, was the architect, and the late Mr. D. Debenham, of Betchworth, the builder. The drawing here illustrated was hung in this year's Royal Academy Exhibition.

HOUSE AT WILLEHALL PARK, BARNET.

The architect of this house is Mr. G. D. Martin. We have no other particulars.

REDBILL AND LEIGATE PRESBYTERIAN CHURCH.

This building is to be erected in the Reigate-road from the design selected in a limited competition. Mr. W. George Leithbridge, F.R.I.B.A., of Draper's-gardens, London, E.C., is the architect. The building is to be faced with Kentish ragstone with Bath stone dressings, the roofs being covered with Broseley tiles. The internal joiners' work is to be stained and varnished.

PALLADIAN BRIDGE, PRIOR PARK, BATH.

The well-known Palladian Bridge spans the lake, and is a prominent feature in the landscape of Prior Park, Bath, Somerset. The mansion in Prior Park was erected for Mr. Ralph Allen from the designs of John Wood, of Bath, in 1740. It consists of a massive central block, having a vast Corinthian hexastyle portico and pediment, and the balustrade with which the structure is 'rested' is connected by vaulted arcades to wings on each side. Architecturally, it is a palace with a park. The design is such as we find in such places as Blenheim and other creations of Vanbrugh. It stands 400 ft. above the city of Bath, over which it obtains a fine view. Being thus on a slope, the architect had a good opportunity of forming terraces, which he has used to the best advantage; and the cuttings and ditches are admirably adapted to the ground and are remarkably clever. The buildings are not devoted to residential purposes, for which they were

erected, but for some time past have been occupied as a Roman Catholic College. Our drawings are from the pencil of Mr. W. H. Watkins, of Bristol.

CHIPS.

A brass has just been placed in Evesham Parish Church to the memory of Miss Mary Kingley, the well-known traveller, who died in Cape Colony last year. The brass is bordered with black marble, inscribed with a text from the Koran in Arabic, a translation of which is as follows: 'We beseech the Lord of the Daybreak to preserve us from the perils of the day and the perils of the night.' This is the 'Traveller's Amenet,' worn on a piece of parchment by every Mohammedan as a talisman.

Corners-stone of a new Baptist school-chapel, which is being built at Castleford, were laid last week. The building will be at the junction of Albion-street and St. Martin's-street, will cost £1,000, and will provide accommodation for 250 persons.

An arcade has been constructed between the Royal Arcade and Castle Meadow, Norwich, and was opened last week. The architects were Messrs. Morgan and Buckingham, of that city, and the builder was Mr. Fye, of Sax-croft, Norwich.

Six stained-glass windows have been placed in St. Bride's Church, Penarthshire, to the memory of the late Lord Kensington and his father, the well-known Liberal Whip.

Bewcastle Moss, over which Dandie Dimmont made his memorable ride, possesses an ancient church and turret cross, which date back to the Anglo-Saxon missionaries. The church has been reopened, after restoration, by the Bishop of Carlisle. The restoration has been carried out under the personal supervision of Mr. W. G. Collingwood, the late private secretary to Mr. John Ruskin.

The rural district council of Newton Abbot have adopted a scheme by Mr. G. D. Bellamy, C.E., for sewerage of the village of Moretonhamstead, at an estimated cost of £2,200.

The marble statue to be erected in Leamington to the memory of the late Queen is being executed by Mr. Albert Toft, sculptor, South Kensington. Her Majesty is represented in a standing position, 9 ft. 6 in. high. In the right hand she has the sceptre, and in the left an orb. She is clad in her State robes, the cloak being enriched by ermine. In the skirt, which is parted in the front, is a wide band of arabesque pattern, with plain pieces on either side as a contrast. Across her breast she wears the Order of the Garter, the Star of India, and other decorations. The cloak is brought over the front of the base of the pedestal, and is fastened to the figure. She wears a veil of rich Oriental embroidery.

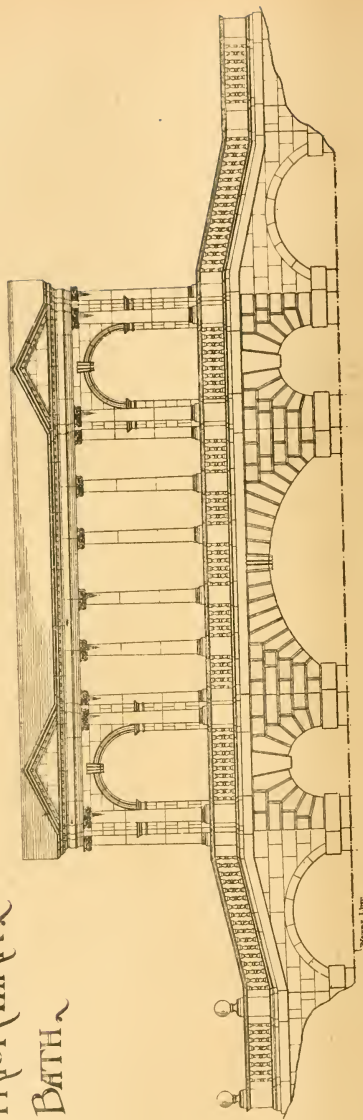
It was reported to the Hants County Council at their last meeting that the new police-station at Hartley-row, the cottages at Farnham, police-station, and the new Basingstoke police-station had been completed, and the erection of the new police-station at Woolston had been commenced, all from plans by the county surveyor, Mr. W. J. Taylor.

The Southampton Town Council received at their last meeting a report from their housing committee, which stated that they had considered plans and estimates, submitted by the borough engineer, Mr. W. B. Bennett, for the erection of double tenements of five and six rooms each, by the Government Board in the area north of Simnel-street, and also the subject of inviting architects to submit designs for the erection of buildings on the area. The committee recommended the Council to adhere to the plans already submitted to the Local Government Board for the provision of 70 cottages for the housing of 400 persons, and that the borough engineer be directed to report as to the probable revenue to be derived from the tenements, and sent slightly less than that previously estimated for. The report was adopted.

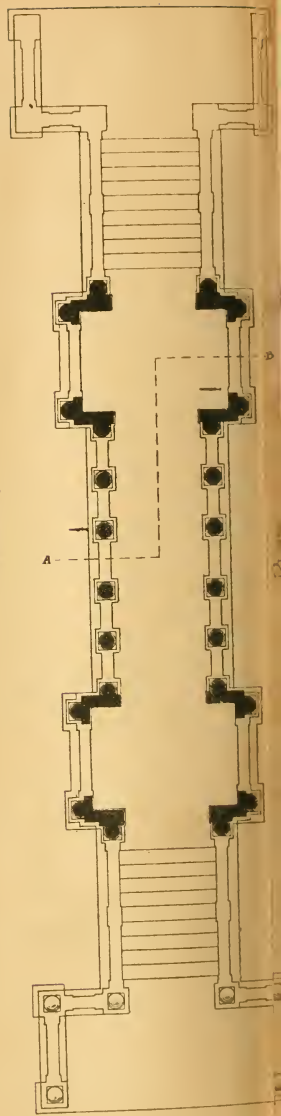
Memorial-stones have been laid of a new Presbyterian Church in West Stanley, Co. Durham. Messrs. Bichen-chill and Bruce, of Newcastle-on-Tyne, are the architects.

Rapid progress is being made with the railway extensions in the vicinity of Orpington and with the new station. Much of the building work has been accomplished, and a considerable area of land has been acquired. The widening of Crofton-road bridge has been pushed forward. The ground covered by the station will be very much broader than in the past. New buildings, with commodious booking-offices, waiting-rooms, &c., will be erected on both sides of the line, and the S.E. and D. Company is also constructing a subway. On the Orpington village side of the line an engine depot is to be built, together with a turntable and buffers. From the Orpington station the line will start the light railway across the country to Knockholt, Cudham, and Tatsfield.

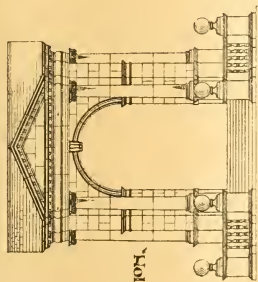
THE PALLADIAN BRIDGE, PRIOR PARK, BATH.



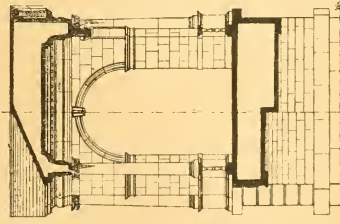
ELEVATION.



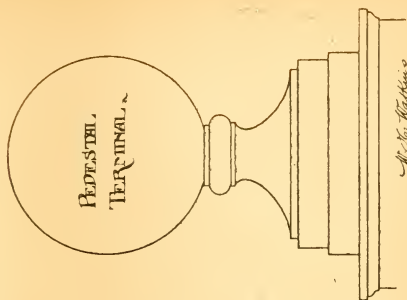
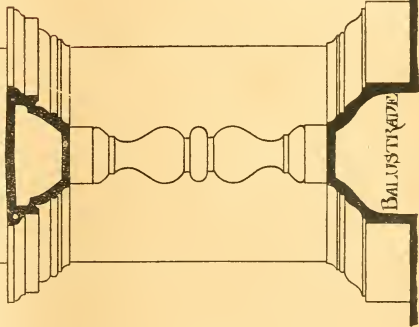
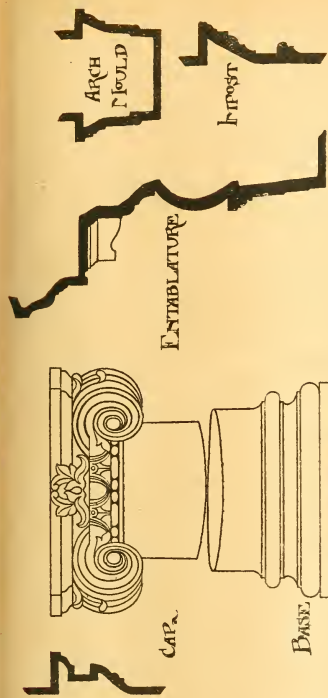
PRIOR PARK, BATH.



END
ELEVATION.



SECTION
A-B.



*M. G. Kitchen
Apr 1801*

Our Office Table.

A *London* Times article has a probability that the late Lord Leighton's house and its contents in 11, Holland Park Road will be accepted by a local authority on behalf of the nation. The libraries committee of the Leighton House Council reports that it has considered a letter from the Leighton House Executive Committee suggesting that the council should accept the contents of their inheritance of the house by accepting the gift of the property, and permanently maintaining it under its statutory powers as an institution for the encouragement of the study of literature, science, and art in the borough. The terms of transfer presented no difficulties in the way of the council accepting the gift. The owners were willing to hand over the lease of the building and grounds, and the Leighton House Sketch Committee proposed also to hand over to the council the very valuable collection of paintings and sketches by Lord Leighton, P.R.A., which have been deposited in the house. As to the cost, the amount which would fall upon the rates would be approximately £100 a year. The committee after full consideration, had come to the conclusion that the gift was one which should undoubtedly be accepted by the council. It recommended that the council do consent, subject to satisfactory arrangements being made for the acquisition of the freehold as well as the leasehold interests, to take over the Leighton House and grounds, and the sum paid down by the owners of the property, and that it be referred back to the committee to continue their negotiations on this basis.

SIR NORMAN LOCKYER and Mr. F. C. Penrose, past-president, R.I.B.A., have laid before the Royal Society the results of their investigation undertaken in the summer of the present year to ascertain from its Orientation the probable date of the original construction of Stonehenge. They have based their argument upon the assumption of Stonehenge having been a solar temple, and they have arrived at the year 1680 B.C. as the approximate date of the foundation of Stonehenge. It is of interest to note that more than 500 years must yet elapse before the sun can be in the same position in relation to the temple as it was at the date of its thus arrived at for the erection of the inclosure.

Some expedition bridge building recently carried out at Walsleybury by the Patent Shaft Company was described by Mr. Walter Mayfarlane in a lecture given before the Staffordshire Iron and Steel Institute at Dudley on Saturday evening. At the beginning of September last the Patent Shaft Company received an inquiry from the representatives of an American railway company asking if they could design and supply a quick bridge work of cast-iron tables for two quick viaducts in North America. The company replied that they were in a position to carry the work through expeditiously. The company followed the inquiry up, and were informed that the Americans required five weeks to design the work. The company undertook to design and ship the work in this time if the order was placed at once. Upon receipt of the location plans on Sept. 16 the designs were got out for both viaducts, and they were approved. The first viaduct consisted of seven spans of 40ft. each and one span of 40ft. long, with five trusses of various lengths, from 5ft. 10" to 21ft. high. These viaducts were designed to carry locomotives of 78 tons weight. The spans and girders were made and shipped by October 9. The second viaduct consisted of two spans, 185ft. each, and one large trestle 90ft. high by 40ft. wide. This viaduct would have been shipped at the same time but for considerable alterations that were required prior to completion. This second viaduct had to be redesigned, and the shipment was delayed, but would be shipped the first week in December.

MR. GEORGE HYLAND, Tech. and Labour-saving Machine Works by Hydraulic Pressure" was the subject of a lecture given by Mr. F. W. Stoney before the Liverpool Engineering Society on Friday night. Mr. Stoney remarked that in the construction of hydraulic machine tools to save the cost of work on a considerable progress had been made during the last few years, so that there was no engineering work now of any dimensions in which plates had to be held with a pressure of more than 1000 lbs. per sq. in. or more. He then showed some slides of work in progress and suggested that there should not be complete

with machine tools and hydraulic power, as an economical means of transmission was unobtainable. The motive power for hydraulic machine tools should be the steam-engine in some form or other, driving the pumps either through shafting and pulleys, electric motor, or pumping engines put down expressly for hydraulic plant. The size of the plant consisting of pumps and accumulator depended entirely on the machine to be used.

The annual report of the board of directors of the American Institute of Architects states that the membership of the institute at the date of the Thirtieth Convention consisted of 285 Fellows, Six Fellows have been added to the list, five have died, and three have resigned since the Thirtieth Convention. There are 215 associate-members, 106 having been elected during the past year, making a total practising membership of 510. There are in addition 69 corresponding and 58 honorary members. It is interesting to review the membership of the American Institute of Architects during past years. Just previous to the year 1888, before the consolidation with the Western Association, the total membership was 203; in 1890, just after the consolidation, the total membership was 473; in 1898 the membership was 411. In the beginning of 1899, the membership was 399, during that year 69 associates were elected, making the total practising membership 457. The largest increase in membership during any year previous to 1901 was in 1881, when 98 members were admitted, representing the increase in both the Western Association and the American Institute of Architects, the number being due to the fact that during this year the Western Association was organized. For the past three years the increased membership has been as follows:—Beginning in 1899 with 399 members, during that year 60 new members were elected, making a total of 459; in 1900, 51 were elected, making a total of 513; in 1901, 106 have been elected, making a total practising membership of 619, and omitting members of those who have died or resigned, it is true that stringent in the requirements of the board and executive committee has resulted in seventeen applications being rejected during the past nine months, but these statistics reveal a suspiciously small roll of membership as compared with the British Institute, Society, and Association, when the population of the United States is considered.

The action of the United States Congress, in appointing a professional committee to prepare a plan for the improvement of the city of Washington, has already borne good fruit, in the interest which the proceedings of the commission have awakened, not only among members of the Government, but throughout the country. It is even thought by some that Washington seems to be last, in a few years, to reach something like the ideal which their forefathers had in mind, laying it out. For the convenience of the public, the commission has arranged for the preparation of two models, at a large scale—one showing the city in its present condition, and the other representing the scheme which the commission advises both of which are placed on public exhibition in a room in the Corcoran Art Gallery.

MR. W. A. FALEY has been appointed to succeed the late Mr. P. Freymann as engineer at the House of Commons. There were upwards of 150 applicants for the post.

The Burnley Corporation have completed the purchase from Lady O'Hagan of Towneley Hall and Park for £17,500. The estate will become the property of the ratepayers from March 25 next. The park will be preserved as an open space for the people, but to what use the hall will be put has not yet been decided by the corporation.

A Local Government Board inquiry was held by Major C. E. Norton, R.E., at the Municipal Buildings, Devonport, on Friday, to consider applications by the Devonport Town Council to borrow £18,200 for sewerage purposes at Ford Valley district, and the sewage disposal works at St. Budeaux and Ford Valley from plans by Mr. J. Diggle, C.E., also to borrow £12,000 for wood-paving improvements effected in parts of Cumberland-road and street, St. Aubyn-street, and Chapel-street.

Mr. Herbert J. Cunliffe, of Ansty House, Wetherby, one of the leading estate agents in Yorkshire, died on Saturday morning, aged 51 years. He was well known in connection with the Leeds Artillery Barracks, and was retired as a major with an honorary rank of colonel. He was a member of the Wetherby Guardians and a district councillor.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. Lecture by Mr. J. C. Poyser, "The Art of the Architect." Society of Arts. "Chemistry of Confectionery Materials and Processes." Canton Lecture No. 2, by William Jago, 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "Train Resistance." 8 p.m.

WEDNESDAY.—Society of Arts. "The Identification of Wood." by J. C. Poyser, 8 p.m.

Edinburgh Architectural Association. "The Applied Arts of To-day and Yesterday," by John Macdonald, 8 p.m.

THURSDAY.—Society of Arts. "The New Trade Routes to Persia," by Edward Poyser, 4.30 p.m.

"Civil and Mechanical Engineers' Society." "Geometric Interpretation of Photographs," by J. Bridges Lee, M.A., 8 p.m.

FRIDAY.—Glasgow Architectural Craftsmen's Society. "Lod Planning and Construction," by C. Ernest Moore, 8 p.m.

WATER SUPPLY AND SANITARY MATTERS.

BRISTOL.—The urban district council of Brighthelm have adopted a storage scheme of water supply prepared by Mr. F. W. Vantstone, C.E., of Paignton. The proposed scheme involves the construction of two existing reservoirs at Ladywell. It is proposed to remove the existing gas-engine and pump from Bolton-street to Ladywell, and utilise them, with a new duplicate gas-engine and pump, for pumping to a new high level with these reservoirs to be constructed at Southdown Cross, and holding 110,000 gallons, or two days' high-level supply. The springs at St. Mary's Well, and those at Higher Brighthelm, could be carried into the large reservoir. Owing to the nature of the main, it is proposed to consider it necessary to make any provision for filtration. The cost of the works is estimated at £16,581.

DUNDEE.—Acting under the instructions of the Secretary for Scotland, Colonel F. Bailey, R.E., Edinburgh, conducted an inquiry, on Friday, into a proposal to demolish blocks of property in Constitution-street, Dundee, in order to effect street widening. The proposal is the result of a tramway scheme to the north end of the town, and to construct the new line with those existing in the Strathmartine district. Mr. James Thomson, assistant borough engineer, stated that the property proposed to be demolished was occupied by the poorer class, and that within a quarter of a mile of the houses proposed to be demolished there were 1000 houses suitable for the people to be dispossessed, and there were in all 1773 such houses in Dundee. Dr. Templeman, medical officer of health, said that with the exception of one block the houses to be demolished were more or less in an insanitary condition, some of them being extremely bad. Col. Bailey said he had inspected the houses and the locality generally, and, as far as he was able to judge, the scheme was a most excellent one.

MANCHESTER.—The corporation waterworks committee, having considered the recent shortness of the water supply, which necessitated an increasingly rigid curtailment of supply from July 21 till the 21st inst., have decided to invite tenders for laying the first section of the second supply pipe from Thirlmere, namely that between Prestwich and Highton, near Blackburn. There will be 14 miles of cast-iron pipes 44in. in diameter, and 10 miles of similar pipes 30in. in diameter, with three-quarters of a mile of steel pipes to be used in carrying the line over bridges. The cost of steel pipes is to be determined by preliminary experimental, and they are therefore to be placed in such a position as shall be easily accessible.

The Civil Service Commissioners announce that an open competitive examination for three appointments as assistant civil engineer in the Admiralty Works Department will be held shortly. Copies of the regulations and forms of application for admission to the examination may be obtained on application by letter to the secretary, Civil Service Commission, Westminster, S.W.

On Saturday night the Right Hon. Lewis Fry formally opened the house which Sir W. H. Wills has provided for the village of Blagdon at a cost of upwards of £2,000. The house is in the style of half-timber work above the ground floor, to which a caretaker's house is attached, the building is two stories in height, and is built of native stone. On the ground floor are the reading-room and library. The former is 20ft. by 18ft. and is a large hall, whilst the latter is 20ft. by 18ft., and of the same height. A staircase leads from the hall to the upper rooms, of the same dimensions as the lower, one being intended for the billiard-room, the other a games-room. The architect is Mr. Frank W. Wills, of Bristol, and Messrs. J. and C. Clark, of Rickford, were the builders.

WORKMEN'S COMPENSATION ACT, 1906.—FIELD V. LONGDEN AND SONS.—Judgment has been given in the Court of Appeal, by the Master of the Rolls and Lords Justices Stirling and Mathew, in favour of the plaintiff, the County Council, in the Sheffield County-court in an arbitration under the Workmen's Compensation Act, 1906. The applicant for compensation was a bricklayer's labourer, employed on October 29, 1900. The injured workman's average weekly earnings at the time the accident were 30s. A fortnight after the accident the employer commenced to pay a lump sum, which the injured workman of 15s., and the payments were continued to be made till April 10, 1901. A few days after the date the solicitor of the injured workman wrote a letter to the employer, asking for the lump sum, and saying that he would be glad to hear of an offer of compensation. The employers replied that they were paying the workman the full weekly allowance, and were willing to pay a lump sum, but that they were not prepared to pay more. Further correspondence passed between the parties. The applicant mentioned a lump sum which he would be willing to accept. The employers, after consulting their solicitor, offered to pay a lump sum, which the applicant refused to accept. On April 25 the applicant filed a request for arbitration, claiming 15s. a week during incapacity. At the arbitration the employers offered to pay a lump sum, and he said that there had been no agreement to settle either by lump sum or weekly payment, but that he received 15s. a week from a fortnight after the accident, and that he was not satisfied with the employer's liability, but never admitted it. The employers contended that there was no question to arbitrate upon, as the applicant had been regularly and fully paid, since that accident, and that he was not entitled to the lump sum, he was entitled to have a finding recorded for him. The County-court Judge held that the applicant was entitled to an award, and made an order for a further award, and the employers appealed. The County-court Judge had no jurisdiction to make an award—first, because no question had arisen between the parties under the Act; secondly, because, if any question had arisen, it had been settled by agreement. The Court allowed the appeal. The Master of the Rolls said that, on the facts of the case, under section 1, subsection 3, of the Workmen's Compensation Act, it was necessary, in order to found the jurisdiction of the arbitrator, that some question should arise between the parties as to the liability to pay compensation, or as to the amount of compensation, or as to the duration of compensation. And secondly, even if such question had arisen, the jurisdiction was ousted by agreement, then the jurisdiction was ousted! But it was essential, in the first place, that there should be a question in dispute. Here no question ever arose, and no question for arbitration did not itself create a question in dispute. It was important

the notice the provisions of paragraph 8 of the contract and the Act, which dealt with the signing of a memorandum of agreement to the register of the County-court to be recorded. The appeal must be all well. Lords Justices Stirling and Maithew delivered judgment to the same effect.

CHARGE 1900 GREENWICH.—George Hypolyte Le Bar, greenhouses builder, of Laywell-road, Lewisham, was charged at Greenwich Police-court last week, on remand, with obtaining money by false pretences. At the previous hearings of the case, evidence was given by a number of witnesses that they had sent bills for greenhouses &c., together with cheques, and had not received what they were owed from prisoner, who traded as the Straight-on with Portable Building Company, the advertisements of which led to the orders being sometimes in the name of Mitchell. The defendant, who is a half at Greenwich County-court, produced the file of proceedings in bankruptcy against prisoner in September, 1900. His liabilities were £13 17s. 1d., and assets £5 17s. 1d. Most of the liabilities were for cash sent for goods which were not supplied. The bankrupt had not received his discharge. There had been nine summonses against him in the Greenwich County-court since he had been at Straight-on with Portable Building Company, the bankruptcy, carried on business at Trudley's-road, Deptford, where he had a large stock and plant. Prisoner was remanded, the bail being enlarged.

WARNING TO BUILDERS.—Mr. Barnett Gillman was summoned at the Worship-street Police-court last week for neglect to give notice to Mr. H. Loxgrove, district surveyor of Chelsea, and to erecting the building without brick walls as required by the London Building Act. Mr. Mead imposed a fine of forty shillings and costs for the first offence, and ordered the structure to be removed in 14 days.

THE CHARGE OF THREATENING AN ARCHITECT.—A Bow-street Police-court case on Friday, Jan. Elgar, 25, described as a student, was charged, on remand, with threatening with a loaded revolver Mr. Jas. Neale, F.S.A., an architect, of 10, Bloomsbury-square. The facts were fully reported in our last issue, p. 711. Mr. Marchant instructed the police to retain the revolver, saying he did not consider that as a portion of a cyclist's outfit. The accused would have to find two sureties in £100 each to keep the peace for 12 months.

CLAIM BY TENANT AND BUILDER.—NORTHOVER V. BUTT.—In this case, heard by Mr. Justice Darling and a common jury, Albert Northover, of 10, Berrymead Lodge, Winchester-street, Acton, sued Mr. Frederick Butt, dairyman, of Acton, to recover £136 17s., balance of an account for work done. The defendant's statement of the plaintiff stated that in 1899 he became the tenant of the defendant's house, Berrymead Lodge, Acton, at a rental of £60 per annum. When he entered into possession he found the premises in a bad condition, and he offered to carry out the repairs, receiving an assurance from the defendant that he would not be asked to do the repairs. The works were executed, and the defendant agreed to pay for them as soon as he sold the house. He also, at different times, made certain additions to the house, and carried out repairs, which the defendant agreed to pay for. In cross-examination by Mr. Warren, plaintiff and when he was pressed by the defendant for rent he did not refer to his account for work done, because he had given his word of honour to the defendant that he would not. He denied that he was convicted of theft at Maidstone in 1854. The defendant denied that he had ever agreed to pay for alterations and repairs executed by the plaintiff. The plaintiff had asked for permission to make alterations, but never suggested that defendant should pay for them. At that time he had no idea of selling the house. He sold the house to the urban district council in October, 1901. The jury found a verdict for the defendant. Judgment awarded, with costs.

WHAT A BATTERED SAILOR?—This question was asked at Debouary County-court on Wednesday week. Ezra Kaye, joiner, fell from a plank to which there was no fastening, and was killed. He was 64 years of age. The defence was that there must be more than one person to take down a man's Honour found for Kaye's father, with £108 damages against Mr. W. Hodgson, builder.

On Tuesday week Lord Harlech unveiled, and the Bishop of St. Asaph dedicated, the window which has been placed in the Grammar School Chapel in memory of Mr. George Cobley, who for many years was assistant master at the school. The chief object is David hanging to the accompaniment of a harp, while below are Timothy and Paul.

A new clothing factory is about to be erected in Water-lane, Hinxton, for a local firm of wholesale drapers. The new factory will be built on the site of an old one, and is to be, it is said, will be built on a site of 2,000 square yards, and will find employment for about 50 hands. The architects are Messrs. Walter A. Hobson and Co., of Leeds.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Roller-iron Joists, Belgian	£3 0 0	£3 0 0
Roller-iron Joists, English	6 10 0	6 15 0
Wrought-iron Girder Plates	7 10 0	7 15 0
Bar Iron, good Standard	6 15 0	8 10 0
Do, Lowmoor, Flat, Round, or Square	20 0 0	20 0 0
Do, Welsh	5 15 0	5 17 6
Boiler Plates, Iron—		
South Staffs.	10 0 0	10 0 0
Best Scotch-Iron	12 0 0	12 0 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for hand-axe, &c.	£6 15s.	£6 15s.
Builders' Hoop Iron, galvanised, £15-18s. 6d. per ton.		
Galvanised Corrugated Sheet Iron—		

	No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive	£11 5 0	£11 12 6
gauge	11 5 0	12 12 6
Best ditto	11 15 0	12 12 6

	Per ton.	Per ton.
Cast-Iron Columns	£6 10 0	£5 10 0
Roller-iron Stand-bones	8 0 0	8 10 0
Roller-iron Fencing Wire	8 0 0	8 5 0
Roller-iron Fencing Wire	8 0 0	8 5 0
Galvanised	8 0 0	8 5 0
Cast-Iron Sash Weights	4 10 0	4 15 0
Cast Nails, 5in. to 6in.	8 10 0	9 15 0
Cast Floor Brads	9 0 0	9 10 0

Wire Nails (Points de Paris)—										
0 to 7	8	9	10	11	12	13	14	15	B.W.G.	
8.6	9.0	9.3	9.9	10.3	11.0	11.9	12.6	13.6	per cwt	
Cast-Iron Socket Pipes.—										

LIST OF COMPETITIONS OPEN.

Tyndalbreath—New Schools		J. Cook, Clerk, Trewartha, 1, St. Station, Glasgow	Dec. 31
Burslem—Isolation Hospital	£100, £200	Arthur Ellis, Town Clerk, Burslem	21
Colchester—Laying-out Sixteen Acres as Recreation Ground	£20, £40, £5	F. C. Boucher, Clerk, Grange-street, N. 3, Colchester, Kent	Jan. 1
Kirkcaldy—Science and Art Schools (400 to 500 places)		Alexander Beveridge, Clerk to Burgh School, 10, K. Kirkcaldy	15
Kirkcaldy—Elementary School (400 places)		Alexander Beveridge, Clerk to Burgh School, 10, K. Kirkcaldy	15
Hull—Art School, Hunt £10,000 (Assessor, Sidney R. J. Smith, F.R.I.B.A., 14, York Buildings, W.C.)	£100 (merged), £20, £10		31
Glasgow—Two Halls for Poorer Classes, Alexandra Park	£100, £50, £25	E. J. D. Macrae, Town Clerk, City Chambers, Glasgow	31
Melbourne, Aus.—Status of Queen Victoria Marble or Bronze		The Agent-General for Victoria, 15, Victoria-st., Westminster, S.W. 1	31
Liverpool Cathedral—Drawings of Designs or Executed Work	300s. each to Architects in Final Competition	The Hon. Secretary, Church House, South John-street, Liverpool, June 30	31
London, S.W.—Tractor for Military Purposes	£100, £20, £25	The Secretary, Mechanical Transport Committee, War Office, Horse Guards, Whitehall, S.W.	1903 Jan. 1
Landrindwell—Laying Out Recreation Ground, &c.		D. C. Davies, Clerk to Council, Llandrindwell, Wales	39
Cam—Drainage Scheme	£50	James Daly, Acting R.D.C. Clerk, Taun, Ireland	39
Northampton—Boarding-House and Playing Field, cost £3,000	No first; 25gs.	J. Haviland, Clerk to Governors, 2 St. Giles-square, Northampton	—
Billingdon—Chadderton—Stanley-road Schools		J. Whitehead, Clerk to School Board, Chadderton, Oldham	—
Northampton—Laboratories, &c. (cost £4,000), Abington-st.		J. Haviland, Clerk to Governors, 2 St. Giles-square, Northampton	—
Leigh—Baptist Church and Schools		The Rev. W. Jones, Secretary, Hope House, Ashton Bridge	—
Leigh, Lancs—Cottage Hospital	£30, £20, £10	J. H. Cox, Hon. Sec., Williams Deacon's Bank, Leigh, Lancs.	—

LIST OF TENDERS OPEN.

	BUILDINGS.		
Halifax—Infants' School at Hough Shaw	School Board	C. F. L. Horsfall and Son, Lord-street Chambers, Halifax	Nov. 30
Shotton Colliery—Business Premises	Hawley Co-operative Society	J. M. Garry, F.R.I.B.A., West Hartlepool	30
Widmores—Residence	John Muld	Robert Walker, F.R.I.B.A., Widmores	30
Bippen—Lateral Club and Hall	J. A. McLeary	W. Clement Williams, Architect, 29, Southgate, Halifax	30
Arncott—Schools, Main-street	School Board	J. S. Moffatt, Architect, 30, Church-street, Whitehaven	30
Aberkane—Four Houses, Pandy Estate	Mrs. E. J. Fugh	J. E. Fugh, Prince of Wales Hotel, Aberkane	30
Whitby—Additions to Property, Baxgate	Co-operative Society	John Farrer, Architect, 2, Coleman-street, Leeds	30
Seaton—House	Mrs. Hodgson	J. J. Milligan, Architect, Baxgate, Whitby	30
Glasgow—Inclosing Clog Siding at Pink-ton	Urban District Council	Donald and Tate, Architects, 14, John-street, Worthington	30
Bethul—Cemetery Chapel, Church Green	Urban District Council	W. H. Hill, M.S.A., Devonshire Chambers, Bethul, Sussex	30
Leeds—Sixteen Houses, York-st.	Urban District Council	W. G. Scott and Co., Architects, Victoria Buildings, Worthington	30
Agriest—Shop, Warehouses, Hall, &c.	Urban District Council	T. Rodenick, Architect, Ashbrook House, Clifton-street, Aberdare	30
Leeds—Thirteen Houses and Two Shops	Urban District Council	W. Hart, Architect, 14, Clifton-street, Leeds	30
Leeds—Fire-Engine Station and Central Chamber	Urban District Council	W. W. Williams, Architect, 63, Wind-street, Swansea	30
Leeds—Section Baptist Chapel	Urban District Council	W. Clement Williams, Architect, 29, Southgate, Halifax	30
Bippen—Lateral Club and Hall	School Board	Wangon Hill, Architect, Grosvenor, Leeds	30
Leeds—Assembly Buildings	Urban District Council	Young and Mackenzie, Scottish Provident Buildings, Belfast	Dec. 2
Glasgow—Eastern District Hospital, Duke-street	Urban District Council	J. Baxter, I.M., 243 St. Vincent-street, Glasgow	2
Edinburgh—Two Villas	Urban District Council	W. H. Hill and Son, Architects, 28, South Hill, Cork	2
New Garmouth—Hospital School	Urban District Council	Landow and Griggs, Architects, Newport, Mon.	2
Bowditch—Additions to Ogley-Hay Schools	Urban District Council	T. H. Fleming, Architect, 102, Darlington-street, Wolverhampton	2
Leeds—Yard—Nineteen Cottages	Urban District Council	W. Dowdell, Architect, John-street, Trowhat	2
Leeds—Temporary Iron Fire Station, Beckenham-road	Urban District Council	W. H. Longin, Surveyor, Town Hall, Asker, S.E.	2
Leeds—Villa	Urban District Council	W. H. Hill and Son, Architects, 28, South Hill, Cork	2
Leeds—Converting Warehouse Donations into Sick Ward	Urban District Council	W. E. Pearce, F.R.I.B.A., 15, Upper King-street, Norwich	2
Leeds—Yard—Twenty-five Cottages, Minister Drive	Urban District Council	Ernest J. Hammond, M.S.A., Architect, High-street, Herne Bay	2
Leeds—Gothic-hall Inn	Urban District Council	W. J. Fennell, M.R.I.A.I., Architect, 2, Wellington-place, Belfast	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	W. E. Pearce, F.R.I.B.A., 15, Upper King-street, Norwich	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	J. O'Leary, Architect, 16, Infirmary-street, Leeds	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	The Engineer's Office, Bristol Station	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	J. E. Henshaw, Architect, Carlton House, Brighton	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Austin and Paley, Architects, Castle Park, Lancaster	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	J. and S. F. Clarkson, Architects, 136, High-street, Poplar, E.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	J. C. Hawtins, 9, Queen-street, Huddersfield	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	J. Berry, Architect, 9, Queen-street, Huddersfield	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	The Secretary, H.M. Office of Works, St. John's Gate, S.W.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	B. Jacobs, Architect, Lincoln's Inn Buildings, London	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	J. Lorimer Miller, Architect, 33, Hild-st., Berwick-upon-Tweed	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	The Borough Engineer, Town Hall, Leamington	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Senior and Clegg, Architects, 15, Regent-street, Barnsley	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Piddick, Chadwick and Co., Architects, 5, Pall Mall East, S.W.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	The Club Secretary, Bournemouth Crescent, Bournemouth	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Stephen Shaw, F.R.I.B.A., Kendal	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Gordon and Garton, Architects, Finsbury House, E.C.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	F. P. Trepos, Architect, 8, Juxley-street, Warrick	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	W. H. Spaul, F.R.I.B.A., The Gables, Oswestry	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	E. Mawdesley, Town Clerk, Town Hall, Crofton	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Melley Hall, M.S.A., 29, Northgate, Halifax	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	E. Mawdesley, Town Clerk, Town Hall, Crofton	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	The Town Clerk, Town Hall, Huddersfield	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	T. Wilson, Architect, 10, Durham-st., Blackhill	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	F. T. Book, Architect, Wolfson Chambers, Wolverhampton	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Jacob Rees, Architect, Hillside, Poole	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	W. Egerton, Surveyor, 12, Queen-street, Perth	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	W. J. Fennell, M.R.I.A.I., Scottish Provident Buildings, Belfast	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	The Gen. Sec. Archt. Dept., County Hall, Springfield, S.W.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	W. E. Pearce, F.R.I.B.A., 15, Upper King-street, Norwich	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Gelder and Kitchen, Architects, 18, Lwgate, Hull	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	B. T. Hookway and Sons, Architects, Braintree, Essex	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	George Green, Borough Engineer, Town Hall, Wolverhampton	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	H. F. Livesey, Architect, Bishop Auckland	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	The Secretary, H.M. Office of Works, St. John's Gate, S.W.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	H. W. Waking, County Architect, Guildhall, S.W.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	W. F. Stocker, 90 and 91, Queen-street, Chesham, E.C.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	B. Jacobs, Architect, Bowland, Lancs.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	C. F. Dawson, Surveyor, Public Office, Barking	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	The Architect's Dept., Housing Branch, 18, Pall Mall East, S.W.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	J. B. O. King, 20, King-street, South Shields	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	H. T. Sugden, Architect, Eversley, Winchester	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	J. Wightman Douglas, 40, Bondgate, Alnwick	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	W. H. Ansell, Architect, 228, High-street, Kirkcaldy	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	W. H. Ansell, Architect, 228, High-street, Kirkcaldy	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	The Borough Engineer, Town Hall, Macclesfield	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	James Wright, Architect, Great St. Mary's, Macclesfield	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Edwin T. Hall, F.R.I.B.A., 54, Bedford-square, W.C.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Haberhorn, Fawcaker, and Groves, 14, Pearl-street, Cardiff	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	James Wright, Architect, Macclesfield	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	B. Drake, Architect, 31, Pearson-lane, Bradford	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Blair and Brown, Architects, Harrogate	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	James F. Ellis, Architect, Exmouth	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	G. L. Watkins, Architect, Carlisle	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	John Kelsall, Architect, Kirkby Lonsdale	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	James Gough, Architect, Beesgrave-street, Stourton	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	Openshaw and Gill, Architects, Heywood	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	E. Jones, Architect, Forth, Wales	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	J. R. Bailey and Son, Architects, 3 Scott-street, Keighley	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	John Hunt, A.R.I.B.A., 40, Upper Baker-street, N.W.	2
Leeds—Yard—Nineteen Cottages, Minister Drive	Urban District Council	T. H. Watson and Son, Architect, 9, Nottingham-place, W.	2

BUILDINGS—continued.

Bunbury—Brewery, Kipling Green	Clubs Brewery Co., Ltd.,	Charles Riley, Architect, 21, St. James's Hall, Bunbury	Nov. 30
Le-Quise—Six Houses and Shop, Thorpe-lane	Powinny's Ltd.	W. Wrigley, Architect, 6, Westgate, Wakefield	Nov. 30
Hall—Restaurant and Shop, King Edward-street		A. Neill and Son, Architects, 38, Park-row, Leeds	Nov. 30
Belton—Villa at Whithead		A. E. Wilson, Estate Agent, 22, Wm. Street, Belfast	Nov. 30
Newcastle-upon-Tyne—Three-story Stabling, W. Handford-st	Co-operative Wholesale Society, Ltd.,	F. L. E. Harris, A.R.B.A., Balloon-street, Manchester	Nov. 30
Sutton, Co. Dublin—Two Houses		G. F. Beckett, Architect, 97, Stephen's Green, South Dublin	Nov. 30
Castlebury—Three Houses, Bursgate-street	Dean and Chapter	W. J. Jennings, Architect, 21, Margaret-street, Canterbury	Nov. 30
Wombwell—Eight Houses	School Board	John Robinson, Architect, Wombwell, Yorks	Nov. 30
Rotherham—Temporary School (200 places)		James E. Knight, Architect, Colley-street, Rotherham	Nov. 30
Broadstairs—House, North Foreland Estate		W. H. Woodcock, Architect, 22, Wm. Street, Southwark, S.E.	Nov. 30
Tringley—Additions at Wharfedale premises	Ironbridge & Coalbrookdale Co-op. Sy	A. B. and W. Scott Deakin, Architects, 72, Pride Hill, Shrewsbury	Nov. 30
Wombwell—House	Mrs. Francis Lay	John Robinson, Architect, Wombwell, Yorks	Nov. 30
Derby—Church, Shaftesbury-premises		E. R. Atterley, M.A., A.R.C.S., Long Acre, W.C.	Nov. 30
Bradford—Additions to Warehouse, Church Bank Buildings		H. Hardaker, Architect, Fregate Chambers, Bradford	Nov. 30

ELECTRICAL PLANT.

Cheekston—Electrical Plant	Urban District Council	Gibbons and Baker, Piccadilly Mansions, London, W.	Nov. 30
Dewsbury—Two Dynamos (100-kw.)	Corporation	H. R. Chapman, Borough Electrical Engineer, Dewsbury	Dec. 2
Greenock—Meters (One Year)	Electricity Committee	W. M. Nelson,burgh Elec. Eng., Hunter-place, Greenock	Dec. 2
Burnley—Electric Lighting at Workhouse	Guardians	Sherrard and Wainwright, Eng., Grosvenor Chambers, Leeds	Dec. 2
Barnfield—Electric Trams	Corporation	K. F. Cammell, M.I.C.E., City Engineer, Huddersfield	Dec. 2
Maidenhead—Electric Lighting Plant	Corporation	Bursall & Monkhouse, C.E.s, 14, Old Queen-st., Westminster, S.W.	Dec. 2
Southampton—Electric Motors	Ordinance Survey Director-General	Freese and Davis, 8, Queen Anne's Gate, Westminster, S.W.	Dec. 2
Pontypridd—Electric Power Station Plant	Urban District Council	Sidney Watson, Clerk, Pontypridd	Dec. 2
Nantwich—Electricity Plant	Urban District Council	W. H. Treanthen, 39, Victoria-street, Westminster, S.W.	Jan. 6

ENGINEERING.

Kirkcaldy—Tramway Rolling-Stock	Corporation	Kennedy and Jenkin, 17, Victoria-street, Westminster, S.W.	Nov. 30
Cilferose—Settling Tanks	Corporation	Arthur R. Beavard, Borough Surveyor, Church-street, Cilferose	Nov. 30
Burgess—Lighthouses	Trinity House, Corporation	W. G. Verity, 7, Great Marlborough-street, London, E.C.	Nov. 30
Cambwell, E.S.E.—Boilers, &c., Wells-street	Borough Council	Maurice B. Adams, F.R.I.B.A., Clement's Inn-passage, W.C.	Nov. 30
Exeter—Crane	City Council	The City Engineer, 18, Bedford-crescent, Exeter	Nov. 30
Truro Point, Plymouth—Steel Lighthouse	Trinity House, Corporation	Charles A. Kent, 10, Victoria-street, London, E.C.	Nov. 30
Aylesbury—Heating Apparatus at Town Hall	Urban District Council	J. H. Bradford, Surveyor, Town Hall, Aylesbury	Nov. 30
Shirderidge, E.C.—Artesian Well, Pittfield-street Baths	Borough Council	H. Mansfield Robinson, Town Clerk, Old-street, E.C.	Nov. 30
Cleethorpe—Underpinning with Thrushouse U.D.C.	Board of Guardians	Ernest Wright, Engineer, Farnley-road, Cleethorpe, Lincs.	Nov. 30
Manchester—Plant for Start-up Generating Station	Electricity Committee	G. F. Metzger, Chief Engineer, Dickinson-street, Manchester	Nov. 30
Manchester—Refrigerating at Gasworks	Urban District Council	A. J. Jackson, Manager, Gasworks, Padham, Lancs.	Nov. 30
Southampton—Refrigerating at Airfield	Harbour Board	James H. Bunting, Town Quay, Southampton	Nov. 30
Birkenhead—Two Lancashire Boilers	Corporation	J. W. M. Richardson, Water Engineer, Town Hall, Birkenhead	Nov. 30
Huddersfield—New Steel Girder Bridge, Gasworks-street	Corporation	The Borough Engineer, 1, Peel-street, Huddersfield	Nov. 30
Leeds—Filtration Tanks at Airedale Mills	Guardians	D. G. Gull, Architect, 20, Barnwell-crescent, Macclesfield	Nov. 30
Warwick—Hot-Water Apparatus to Workhouse Infirmary	Public Works Committee	F. P. Treps, Architect, 8, Jury-street, Warwick	Nov. 30
Birmingham—Reconstructing Perforce-road Bridge	County Council	F. Price, M.I.C.E., City Engineer, Council House, Birmingham	Nov. 30
South Norwold—Refrigerating Branch Polytechnic, Schurz-road	Hull Joint Dock Committee	The Deputy Borough Engineer's Office, Town Hall, Croydon	Nov. 30
Hull—Dock, &c.	Town Council	Sir J. Wolfe Barry and Partners, 21, Delahay-street, Westminster	Nov. 30
Croydon—Heating Central Polytechnic, Scarbrook-road	School Board	The Deputy Borough Engineer's Office, Town Hall, Croydon	Nov. 30
London—Workshop, Country Reister	Urban District Council	J. Whitwell, Engineer, 10, Victoria-street, London, E.C.	Nov. 30
London, W.C.—Light Railways	Board of Guardians	The Contracts Sub-Department, Victoria Embankment, W.C.	Nov. 30
Barnford-on-Avon—Lift Bed, &c.	Urban District Council	S. Howard, Waterworks Engineer, Town Hall, Barnford-on-Avon	Nov. 30
London, N.W.—Water Supply at Workhouse & Infirmary	Town of Guardians	H. Hughes, M.I.C.E., City Engineer, 10, Victoria-street, London, E.C.	Nov. 30
London, S.W.—Twelve Fire-Escapes 40ft. and 50ft.	London County Council	The Clerk, County Hall, Spring Gardens, S.W.	Nov. 30
Birkenhead—Maintaining (6) miles	West Cheshire Water Co.	W. Martin Jones, Secretary, 9, Hamilton-square, Birkenhead	Nov. 30
Barnfield—Refrigerating	Barn District Council	E. Hartwright, Clerk, Chesters Office, Town Hall, Croydon	Nov. 30
Bakewell—Waterworks	Rural District Council	Sterling and Swann, Engineers, Town Hall, Chapel-en-le-Frith	Nov. 30
Wantage—Sewage and Sewage-Disposal Works	Urban District Council	Compton, Common, and Martin, 7 and 8, Bedford-crescent, Exeter	Nov. 30
Waterbury—Water Supply	Urban District Council	C. F. Whitwell, Clerk, Town Hall, Waterbury	Nov. 30
Ireland—Single Railway Viaduct over River Farrow	Fishguard and Roscarroll Railways Co.	Sir B. Baker, 2, Queen's-square, Queen Anne's Mansions, S.W.	Nov. 30
Pury, Lancs—Sewage-Disposal Works	Sewage Committee	Arthur W. Bradley, Borough Engineer, Bury	Nov. 30
Stroudbridge—Three Purifiers	Gas Committee	W. North, Engineer, Gasworks, Stroudbridge	Nov. 30
Littleton—Bridge across River Ash	Middlesex County Council	H. T. Wakelam, County Engineer, The Guildhall, S.W.	Nov. 30
Calcutta—Two Incinerators	Corporation	Fred. Gansford, Secretary, Calcutta	Nov. 30
Lower Egypt—Lock	King's Norton and Northfield U.D.C.	The Inspector-General of Irrigation, Lower Egypt	Nov. 30
Lifford—Refrigerator	Patent U.D. Council	A. W. Cross, A.M.I.C.E., 12, King's Heath, Birmingham	Nov. 30
Trinidad—Refrigerating (Town Bridge)	New South Wales Government	D. J. Leung, Engineer, Pontypool	Nov. 30
Sydney, New South—New Harbour Bridge	Manitoba Municipal	The Agent-General for New South Wales, 9, Victoria-street, S.W.	Nov. 30
P. T. P. Bridge—Two Bridges over the Neva	Concessionaire	The Borough Engineer's Office, Peterborough	Nov. 30
Durban, Natal—Tier	Amplough & Newport Pagnell R.D.C.	B. St. George-Moore, M.I.C.E., 17, Victoria-street, S.W.	Nov. 30
Woburn, Beds—Sinking Well	Bleaching Co.	D. Ballour and Son, Civil Engineers, 1, Victoria-street, London, E.C.	Nov. 30
Harwood Vale—New Air	Baker and Stanton, 19, St. Dunstan's Hill, E.C.	Almon and Sons, Architects, Union Chambers, Bury, Lancs.	Nov. 30
London, E.C.—Conveyors, Lattice Girders, &c.			Nov. 30

FENCING AND WALLS.

Carlisle—Fencing, Gates, &c., about 870 yards	Guardians	H. C. Marks, A.M.I.C.E., City Engineer, 36, Fisher-street, Carlisle	Nov. 30
Leeds—Boundary Wall and Palisading, Beckett-street	Hendon Rural District Council	J. Mitchell Bottomley, Architect, 13, Bond-street, Leeds	Dec. 2
Trout Stream—Oak Fencing at Isolation Hospital	Corporation	F. J. Seabrook, Clerk, Council Office, Edgware	Dec. 2
Loughborough—Fencing, 1000 yds.	Corporation	R. M. Butler, 21, R.F.A.I., 12, London-street, Dublin	Dec. 2
Sunderland—Retaining Wall, South Back Benner Field	Woolwich Union Guardians	The Borough Engineer's Office, Town Hall, Sunderland	Dec. 2
Wimborne—Boundary Wall 500ft. at Union Grounds		J. O. Cook, Architect, 14, Eleanor-road, Woolwich	Dec. 2

FURNITURE AND FITTINGS.

Glasgow—Ranges and Blinds to Premises, Woodlands-road	Corporation	Frank Burnet, Architect, 180, Hope-street, Glasgow	Dec. 2
Leeds—Fitting up Laundry	Leeds & Winstone Union Guardians	G. H. Page, Architect, F.I.A.S., Trinity Chambers, Colchester	Dec. 2
Wilmington—Kitchen Equipment	Town Council	J. B. Broadbent, A.R.B.A., 15, Cooper-street, Manchester	Dec. 2
Wombury—Cane-seated Chairs 100	Town Clerk	E. Badham, Town Clerk, Wombury	Dec. 2
Blancpain—Partitions and Desks at Two Schools	School Board	Lansdowne and Griggs, Architects, Newport, Mon.	Dec. 2
Margate—Bedwood Chairs 400 at Winter Garden	Wells and Bath's Department	Algernon H. Davis, C.E., General Manager, Royal Baths, Margate	Dec. 2

PAINTING.

Glasgow—Coal Siding at Fingleton	Corporation	John Young, Geo. Manager, 38, Renfield-street, Glasgow	Nov. 30
Glasgow—Premises, Woodlands-road	Corporation	F. Barnet, Architect, 181, Hope-street, Glasgow	Nov. 30
Lancaster—Infant School, Skerton	School Board	Austin and Paley, Architects, Castle Park, Lancaster	Nov. 30
King's Langley—Convalescent Home, Levensall Asylum	Metropolitan Asylums Board	T. Deneham, Architect, Clerk, Embankment, E.C.	Nov. 30
Bury Ashfield—Eaten Timber	Corporation	H. Liversidge, Architect, Clerk, Embankment, E.C.	Nov. 30
Charlton Down—Three Blocks of Buildings at Asylum	Committee of Visitors	W. J. Jennings, Architect, 4, St. Margaret-street, Canterbury	Nov. 30
London, E.—Workhouse Infirmary, Bancroft-road	Mile End Old Town Guardians	J. Thacker, Guardians' Offices, Bancroft-road, Mile End-road, E.	Nov. 30

PLUMBING AND GLAZING.

Sheffield—Plumbers' and Glaziers' Work One Year	School Board	Jno. F. Moss, Clerk, Sheffield	Dec. 2
Loughborough—Plumbing and Glazing Work One Year	The Town Clerk's Office, Guildhall, Derby	The Town Clerk's Office, Guildhall, Derby	Dec. 2
Leeds—Lead Service Work One Year	Irish Lights Commissioners	H. E. Priestley, Surveyor, Town Engineer, Town Hall, Cardiff	Dec. 2
Dublin—Coppersmith and Plumbing Work One Year	Works and Ways Committee	The Lighthouse Stores, Kingstown, Co. Dublin	Dec. 2
Nottingham—Plumbers' Work One Year		Arthur Brown, M.I.C.E., City Engineer, Nottingham	Dec. 2

ROADS AND STREETS.

Immingham—Roads and Paths	Town Council	C. Crichton S. Benning, Town Clerk, Dunstable	Nov. 30
London—Paving, 1000 yds.	Urban District Council	Lionel Curtis, Acting Town Clerk, Johannesburg	Nov. 30
London—Paving and Making-up (Hunters' Road)	Paving and Sewerage Committee	J. Bower, C.E., Borough Engineer, Town Hall, Gateshead	Nov. 30
London—Paving and Making-up (Hunters' Road)	Corporation	T. Hurry, Surveyor, Town Engineer, Town Hall, Warrington	Nov. 30
London—Paving and Making-up (Hunters' Road)	Corporation	Thos. R. Hargrave, Borough Surveyor, London-road, Malden	Nov. 30
London—Paving and Making-up (Hunters' Road)	Corporation	George Holman, Surveyor, Council Office, Walsden	Nov. 30
London—Paving and Making-up (Hunters' Road)	Corporation	P. G. Parkman, Surveyor, Town Hall, Hounslow	Nov. 30
London—Paving and Making-up (Hunters' Road)	Corporation	W. J. Spencer, C.E., 33, Howard-street, South Shields	Nov. 30
London—Paving and Making-up (Hunters' Road)	Urban District Council	M. Newell, Engineer, 10, Park Office, Hull	Nov. 30
London—Paving and Making-up (Hunters' Road)	Borough Council	A. R. Robinson, Surveyor, Town Hall, Buntingford, Clacton-on-Sea	Nov. 30
London—Paving and Making-up (Hunters' Road)	Urban District Council	H. H. Scott, Borough Surveyor, Town Hall, Hove	Nov. 30
London—Paving and Making-up (Hunters' Road)	Urban District Council	E. Sumner, Borough Engineer, Town Engineer, Town Hall, Warrington	Nov. 30
London—Paving and Making-up (Hunters' Road)	Urban District Council	The Surveyor, District Council Office, Church	Nov. 30
London—Paving and Making-up (Hunters' Road)	Urban District Council	W. I. Overbridge, 17, Balmoral-road, New Brighton	Nov. 30
London—Paving and Making-up (Hunters' Road)	Urban District Council	D. J. Lobbey, A.M.I.C.E., 10, Victoria-street, Warrington	Nov. 30
London—Paving and Making-up (Hunters' Road)	Urban District Council	Sir R. Newman Chambers, Town Clerk, Loughborough	Nov. 30
London—Paving and Making-up (Hunters' Road)	Urban District Council	A. H. Walker, A.M.I.C.E., 20, St. Paul, Town Hall, Loughborough	Nov. 30
London—Paving and Making-up (Hunters' Road)	Urban District Council	Z. H. Cook of Denon's, Leadenhall-street, E.C.	Nov. 30





BRUNNER MOND CRICKET PAVILION & CLUB.

WINNINGTON PARK NANTWICH CHESHIRE

W. M. MURFORD ARCHT.







REDHILL AND REIGATE PRESBYTERIAN CHURCH.
GEORGE LETABRIDGE · FRIBA · A.M.

Photo Engraved & Printed by James Abernethy & Co. Queen's Square W.



1911







DETAILS.



PLAN.

LINCOLN.

DETAILS OF WINDOW FROM
JOIN OF GAVINS PALACE.



INTAKE.

SECTIONAL

BUTTRESS

CILL.



NORTH ELEVATION.

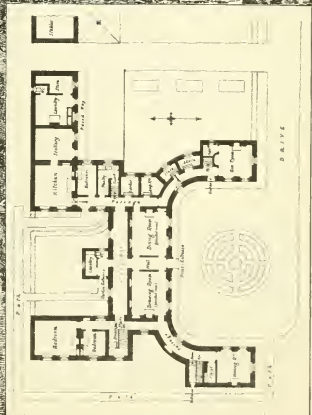
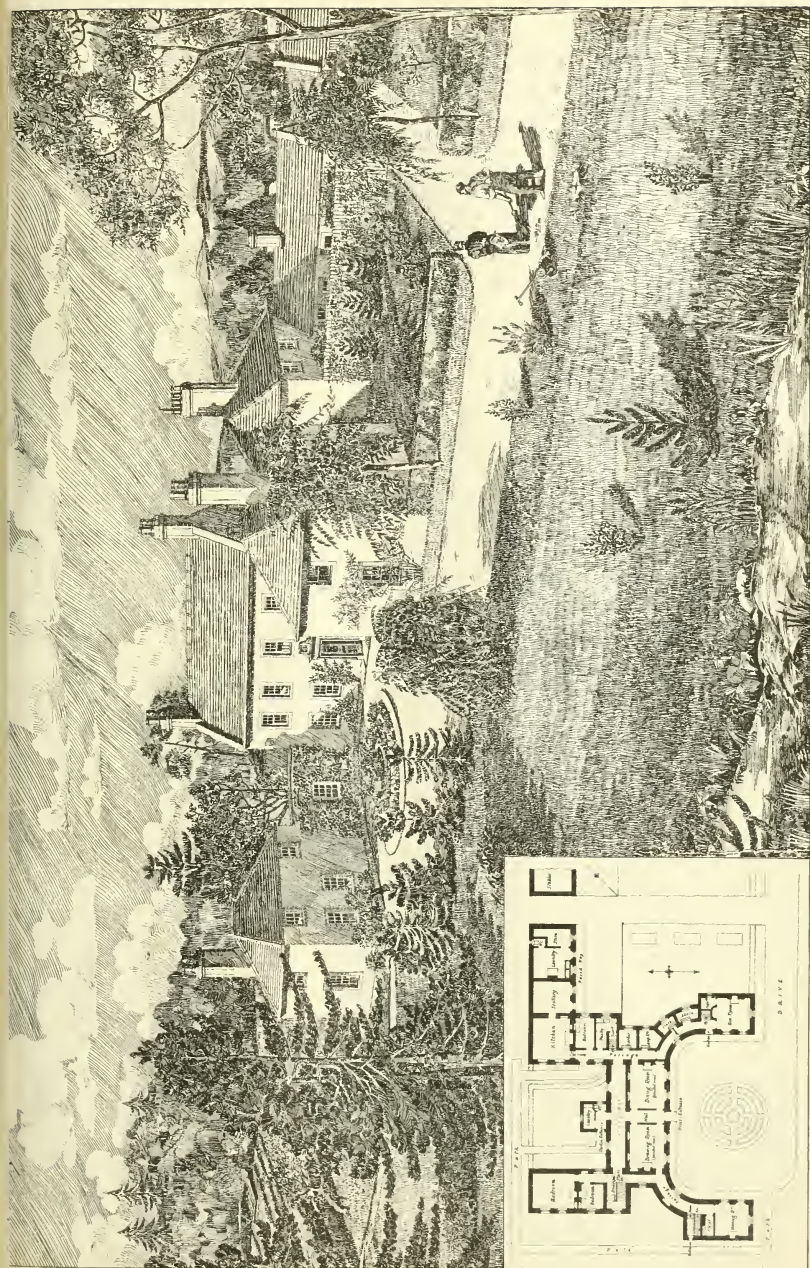


WEST ELEVATION.



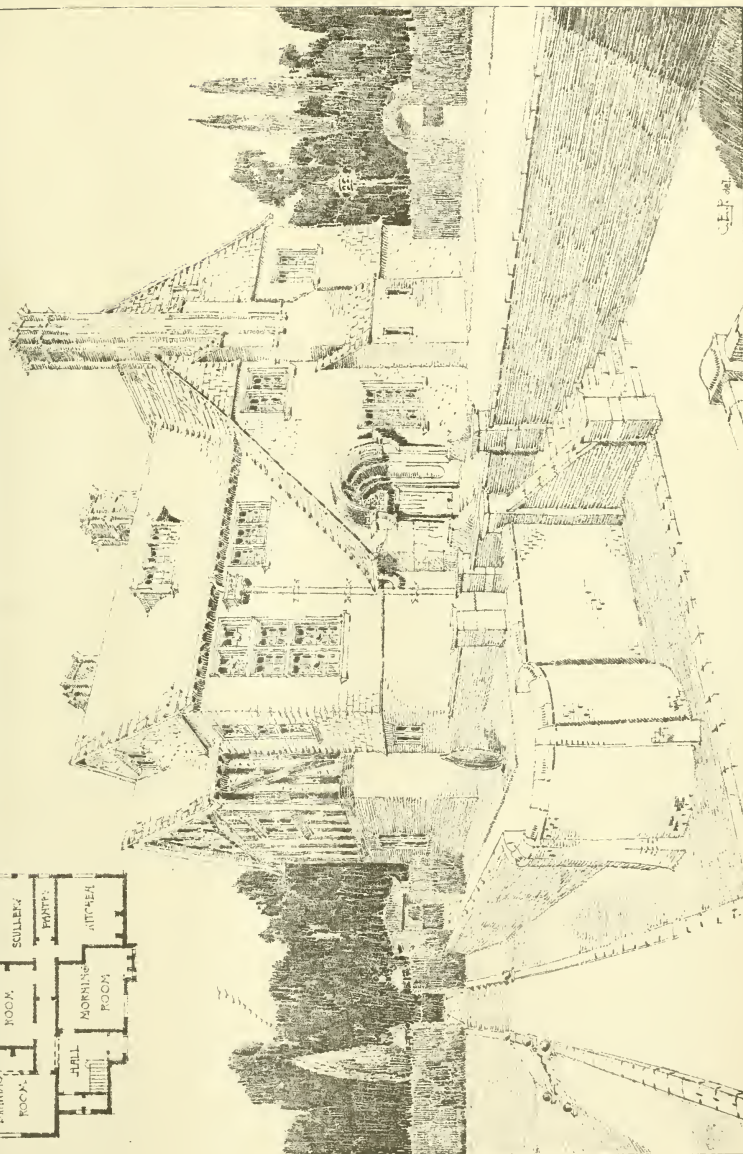
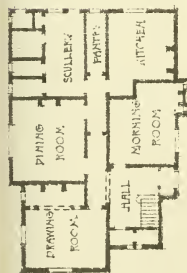
"PHOTO-TYPE" by James Akerman. Queen Square London W





BIRDS EYE VIEW OF 19TH CENTURY SCOTIA MANSION
DRAWN BY A. J. MEACHER, A.R.A.

HOUSE AT WILLENHALL PARK: BARNET: G.D. MARTIN, ARCHTCT.





THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXXXI.—No. 2448.

FRIDAY, DECEMBER 6, 1901.

PROFESSIONAL PRACTICE IN LONDON AND RURAL DISTRICTS.

THE topics dealt with in the recent Presidential addresses of the architectural societies are of sufficient interest to the profession to awaken response. We have lately noticed the remarks made by the President of the Royal Institute of British Architects, and now refer to the address delivered at the Society of Architects by Mr. Silvanus Trevail, who spoke on a variety of subjects of great interest to the profession. The compulsory registration of architects occupied the first place, and it is rather remarkable that the President could support his argument for registration with no less a catena of authorities than the architectural profession of the State of Illinois, which has recently adopted the measure, the opinion of Professor Clifford Ricker, President of the State Board of Examiners, and that of Mr. Seth-Smith, who, in his Presidential address at the Association, to which we recently referred, strongly urged the importance of such a registration to the whole profession. To these names we may add the president of the Leeds and Yorkshire Architectural Society. Even Mr. Emerson, in his remarks at the Institute, has spoken in no uncertain manner of adopting the principle of registering the profession as in the case of the legal profession; in fact, whatever the form of protection, a large proportion of practising architects in the provinces are becoming more sensible of the value to be found in a statutory provision that will be applicable to all practitioners instead of only to those who are members of a particular body. We are sure that the rank and file of the Institute are becoming more and more convinced of the value of such a measure, whatever may be their objection to the system on other grounds. The whole practising body has to be considered, not a part only. It is needless to repeat the arguments we have urged for a general levelling up of the legal and technical qualifications of the architect, which will not in any way supersede those higher gifts which belong to a minority of the profession. Comparing the positions of London and country practitioners, Mr. Trevail pointed out that in London and the larger centres the architect's position is better defined and understood; but in smaller towns his qualifications are less recognised, his social position counts for no more than the incompetent man who calls himself by the same name, and this is the experience of all country practitioners.

An important practical subject dealt with is "Ancient Lights." Any excuse to levy blackmail on an intending building owner is sufficient; he is threatened with an injunction. The typical case supplied by the President is an instance, where rebuilt premises on the old site placed 3ft. further back and only 3ft. 6in. higher than the old building was the subject of a lawsuit which occupied six months in preparation. A crowd of expert and other witnesses were called, and after a delay of some days at the Courts of Justice, the judge awarded £50 damages for a small basement window which only just appeared above the pavement, and which was slightly obscured; and this carried the costs against the building owner to over £900, though his lordship characterised it as a very trumpery case. Thus the owner suffered for the law, but justice was not done. The suggestion of providing Courts of Appeal in each locality where plans of proposed buildings that are likely to affect others can be deposited is a

good one. Adjoining owners would have notice of the proposed building, and that the plans were open to inspection, and if any disagreement arose, the Court would give their decision, and would have power to allow the building to be proceeded with if the damage was not material. The question of actual damage could be ascertained by arbitration.

The subject of Metropolitan improvements came in for a share of attention, and the president chiefly drew attention to the contrast between the great Continental cities, like Paris, Vienna, Berlin, Brussels, Budapest, as regards the width and laying-out of the main thoroughfares and boulevards, when compared with the narrow and insignificant streets of London. This contrast is certainly very great and disappointing; but straightness and width can only be secured by a more liberal policy than we possess in monumental and architectural matters; and they are not after all, so necessary in overcrowded cities like London, where it is of some moment to divide large areas of building as much as possible by smaller intersecting streets. In case of a great procession we know the wide, straight thoroughfares are the most difficult to regulate, and to restrain huge crowds in case of mobs. Londoners have also to consider their climate of fog, and the greater danger in crossing a wide street than one of ordinary width. These are considerations, besides others that may be urged for narrow and irregular streets, which make picturesque variety and order up unexpected virtues. Englishmen would not willingly exchange their City and West-End thoroughfares for the mechanical straightness and restraint of New York or Chicago. A great deal more can be urged about the individual buildings and the style in which they should be erected. Much may be said for a formal style, much for an individual expression. Unfortunately, in London a handsome building is often spoiled by the juxtaposition of another, as the President said, equally ugly; our noble City buildings are huddled together in the most incongruous and picturesque manner. This is mainly the fault of adopting Italian and French palatial styles for commercial and other buildings, that should be of a more unpretentious and national character; Italian and French Renaissance may do very well in wide, spacious boulevards, but they are quite out of place in the Metropolis. The great opportunities of rebuilding London in 1666, and in later times by Sir Charles Barry, have been lost. We have blocks of Government offices in awkward positions, and without any character or design, instead of being grouped as a whole in some central area. The land improvement movement ought to transform a small portion of the Metropolis from dinginess and squalor to palatial magnificence; but we cannot predict the result, nor the kind of architecture that will adorn the main frontages. The Whitehall Government Buildings may be regarded as a progressive step in making Whitehall a great vista of Government offices. No doubt our great municipal cities—Glasgow, Liverpool, Manchester, Leeds—possess a more pronounced and vigorous local public spirit than can be found in London, and to it we must attribute their greater progress in municipal architecture. Mr. Trevail pointed out in this connection that leasehold tenure, with its many drawbacks, should not be tolerated; we may go further, and lay our meagre architecture and piecemeal way of improvement to its doors. No architecture ever flourished under such conditions of land tenure; it is unknown on the Continent, in the States of America, and in our colonies. It is only the owner of his freehold who will care to build well and substantially. The freehold tenure gives a man an interest in his building investment; the owner does not hesitate to go to an architect to obtain the

best design he can; he does not scruple to expend money on decorative art, for he knows he is building for posterity. The leasehold, on the other hand, does not encourage expenditure or architectural design on buildings that will, in a few years, revert to others. Nor can the leaseholder be expected to lay out capital in artistic buildings when every improvement he makes is assessed.

One of the subjects not dwelt upon, but of considerable importance to the profession in country districts, is the recently-issued Model By-laws for Rural Districts, a summary of which we gave not long ago. Architects in these districts have hitherto suffered from a kind of uncertainty as to building, especially with reference to those of a particular kind, such as agricultural buildings, outbuildings like summer-houses, plant and poultry houses, cowsheds, &c. In other cases they were not quite sure as to whether the rules of the urban authority applied to them, or how far the urban authority could interfere, and require certain walls, gables, and roofs to be built according to such by-laws. These new model by-laws will remove all uncertainty. They are "confined to matters affecting health," and do not include the stability of buildings or the prevention of fire, which latter rules very generously pressed on the architect of half-timber erections. As we pointed out when noticing these by-laws, the provisions for structure of walls and foundations are confined to the covering of the site with asphalt or concrete when necessary owing to dampness of site—not otherwise, as in the urban code; to damp-courses, to double walls of basements, &c. But the by-law as to damp-course only refers to every wall of a new public building, or a new dwelling-house, so that other buildings are excluded from the operation of the law. In fact, all agricultural buildings, outbuildings, such as plant-houses, orchard-houses, summer-houses, poultry-houses, tool-houses, &c., are wholly unrestricted, "except that they should not encroach on the open space required to be provided for new domestic buildings." Pigsties and cowsheds are not, however, exempted unless detached from dwelling-house. We have already noticed the effect of these by-laws in regulating the erection of buildings and air-space in front and rear; that a clear space of at least 24ft. be allowed between the fronts of domestic buildings in a street, and that not less than 150sq.ft. be allowed in the rear, or 15ft. across from any part of such building to the boundary of any land or premises immediately opposite or adjoining; but this distance is regulated by the height of the building; if the height be less than 20ft., if 35ft. high or more, the distance must be 25ft. Other by-laws relate to ventilation and drainage. These regulations more or less conform to the old by-laws. The Local Government Board have thus met the requirements of rural authorities who have good reasons for objecting to a code of by-laws that are framed with special reference to urban districts. Parts of rural districts may adopt the more stringent rules of the urban authorities when the buildings are of an urban character and a greater width of street is necessary. Mr. Lacy Rife pointed out at the Royal Institute of British Architects on Monday night, a desirable addition to the new code would be a by-law enabling rural councils to regulate party-walls as distinct from external walls; and we are pleased to see the Institute are bringing this point, at Mr. Ridge's suggestion, before the Local Government Board. These and other topics of professional interest will afford ample material for discussion during the forthcoming season. Legal, official, and statutory requirements have materially hampered the architect in the discharge of his duties. Under newer and

approved conditions of construction, and practice may look forward to more efficient services in the future.

EMPLOYERS AND WORKMEN.

THE Press has not been slow in taking up the question raised by a correspondent in the *Times* as to the "Crises in British Industry," to which we referred in the other day. Several letters have appeared, on the whole, bearing out the complaints of the writer by giving other instances of the "go-easy" policy, on which many tradesmen themselves have borne confirmatory evidence. These numerous letters that have appeared in the *Times* and other papers, it may be of interest to winnow out statements from reliable sources, to draw a distinction between those of the unionists who are engaged in honest work and those who are trying to dup their employers, between men who are contented from principle, and those who exercise their threats and tyranny over young and employed in building trades. It is necessary to discriminate between the "limitation of output," as dictated in the interests of the crafts concerned, and that motivated with the object of wasting time and destructive of the interest alike of master and man. The former may be justified by conscientious reasons, and for the furtherance of an honest agreement between employers and employed, for the best interests of the worker and employer; the latter is quite another and perverted use of the advantages to be derived from unionism and co-operation. The question is not so easily settled as some controversy-ists appear to think, there are faults on both sides—there is the tyranny of the contract employer, as well as the tyranny of the unions. On both sides the policy of individualism, rather than that of collective or corporate unity, has been uppermost, and this attitude of each trying to get the best of the other will continue till better counsels prevail: till employers and men begin to see the absolute necessity for co-operation as a system—one that was followed during the Middle Ages in the great guilds, and followed in our greatest resolutions, and without which disagreement and chaos must result. It is this selfish principle of individual action that is at the root of the present controversy. The fact is, both men and masters are engaged in an attempt to get the most out of a given quantity of work. The contractor whose order is low has to do all he can to obtain a profit, to do which he looks to the workman to do a full day's work for a full day's pay, and as much as he can get for the lowest amount of wages. On the other hand, the workman tries his best to do as little as he can to sell his time under various pretexts, and not to start machine tools too soon.

The correspondence that has been published has not as yet thrown much light on both sides. We may first refer to a long letter which was printed in the *Times* from the secretary of the National Free Labour Union, who has for years been urging workmen not to be misled by mischievous things and lose time, but to apply their brains and skill to their work. The writer draws attention to the experience of some of the members of the association who have worked at large engineering firms in the north of England, where shops were ununionised. His first experience was a deputation of two unionists and old apprentices, who informed him that by the shop rules "no contract was to be started until the foreman's consent arrived," which did not happen till 20 or 25 minutes after the whistle had gone. For disobeying this injunction he was sent to bed for a week. He also refers to the fact that the union foremen kept their men waiting many hours without necessary trainings in for two days doing nothing; that men and machines were kept

idle through lock-outting and the want of proper tools. In other cases "set work" was wantonly interfered with. The foreman found fault with him for turning out too much work. In piecework, the writer says: "The work would be sent by the foreman in the first instance to the day-wage-earners to take all but a finishing cut off, and then sent to the pieceworker to ostensibly finish and draw the full price for." Then it is asserted that "a good deal of the unionist's time is spent in drawing sick and out-of-work relief, and thus they load on their brother unionists, drawing relief, &c." Another correspondent, "Manchester," thinks the masters have the remedy in their own hands by refusing to employ trade-union foremen. An employer in Manchester he relates, purchased a machine tool from an American that was guaranteed to effect a saving of 75 per cent. on the cost of production of a certain article. The tool did not come up to the expectation, and the seller was reprobated with, and, after repeated failure to do the required work, the American came to the works, and told the employer his foreman did not permit it to be worked properly. Asked for proof of this, the Yankee said: "I have been working under an assumed name in your shop as a mechanic for two or three weeks on my own machine, and I was ordered by the foreman to restrict the output of it to one-fourth of what it is capable of doing." He also says he has had labour-saving tools wilfully damaged in every possible way in his own engineering works. We can hardly think such tampering with output could be tolerated, and the charge appears too serious to believe.

The moderate letter by another correspondent in the *Times* lays the blame also on the employer for allowing such a state of things to exist. The employer is not master in his own workshop. Such a condition of things has been growing for years. This writer complains of the stand-off attitude of the master which has created the antagonism between master and workman, and it is pointed out that the workman's and master's interests are not identical. Here, it seems to us, we have the *crux* of the whole matter, for, as we have pointed out, the employer's interest is to get as much work out of a man as he can, and the workman's interest to give as little labour for his wages as he safely can afford. As a non-unionist points out, it is not to the workman's best interest to assist his employer if he is working within the limits of his employment. Suppose, for instance, an employer is short of work: he says to his workmen if they will increase their output, or accept lower wages, he would be able to employ them and prevent his plant lying idle. We may suppose, rather than remain idle or leave the shop, they accede to the proposal. But the case would be different if the men had been working at their full limit, and were then asked to do more. The workmen would refuse: they must be just to themselves, rather than accept conditions that would encourage the master to cut down his prices for the next contract. It is to guard against this bartering of their wages and skill that some restriction must be made, and the craftsman would be safeguarding the interests of his trade, as well as the interests of a contractor who took work under such terms. The writer, while admitting the disturbing influence of trade-unions, admits that the system is a protection from the otherwise untrammelled power of capitalism.

The arguments that have been brought forward are of special interest. On the two leading trades of the bricklayer and the joiner we have already spoken, such as the alleged restricted output, or "go-easy" methods adopted by the unionist bricklayer, stories that we have no means of corroborating, but which find ready acceptance among employers

as well as architects, and we could name others. We are glad to hear the London County Council, by their Finance Committee, are about to make an official inquiry, and report as to the truth of the charges brought against the bricklayers employed by the Works Department, and we believe Lord Welby will satisfy the public on the question. Capt. Swinton's letter in the *Times* is reassuring also. What the public desire to know is whether the "limitation of output" on the part of the bricklayers is dictated by the desire of doing as little as possible, for the benefit of the unemployed in the trade, or is dictated by a wish to counteract the greed of the sweater. Those who are not under the heel of trade-unionism, the country workmen have a different tale of bricks to tell. "A Country Purson," in a letter in the *Times*, made inquiries as to what was considered a fair day's output for a bricklayer, and received the reply from a "neither industrious nor respectable above the average" that 1,000 bricks on "inside work, where there is no careful 'pointing' is a fair day's work; but only 400 bricks for 'corner' or 'quoin' work, which requires the bricks to be cut and fitted and pointed. A respectable and honest workman, who has risen to be a small builder and employer of labour, was asked this same question, and replied: 1,000 bricks as a day's toil for plain inside work. He said he "had laid as many as 1,200; but for that you must go as fast as you can, and not stop to think how you're doing it." The same tradesman said the daily average for all work, including corners, reveals, &c., is about 600. These figures are about the normal amounts, and certainly show that the London County Council limit of 330 is a serious deficiency to be accounted for. But there is a popular misunderstanding as to the figures published. The public impression is that the number laid is the test of the work actually performed; but this is by no means the case. If there was a wager to see which of two bricklayers could lay the most bricks in 10 hours in a straight piece of walling both under the same conditions, our estimate by this mode of counting might be a fair one as to expertness in handling; but it would prove nothing with respect to the competency of the workmen or the quality of the work. The conditions of the actual building are very different. There are various kinds of brickwork—inside work, unpointed; outside pointed work, labour in forming angles and reveals involving cutting and shaping and adjusting bricks, &c.; therefore, in estimating the quantity of bricks laid per diem, we ought to know what proportion these several labours bear to the plain work or the building as a whole, and obtain a fair average. The union limit is 400 bricks—certainly small for ordinary house-building; but if it applies to work where the angle-work and reveals are numerous, it is fair. One thousand a day is only applicable to rough walls and foundation work. Still the public go away with the idea that anything less than 1,000 a day is a fraud on the employer. Also let us remember, even in plain, straight, walling there are degrees of excellence. One man may tumble in the bricks from a barrow, the other lay them carefully and point them. So we can hardly affirm from the small number of bricks laid that the workman is fraudulently trying to "best" his employer. The question before the profession and the public is, Do the unions persuade or enforce men to limit the output of their work for certain trade reasons to the disadvantage and loss of their employers? This is the serious point of the whole business.

Turning to another leading building trade, that of joinery, an instructive letter comes from a joiner in the North of England who relates his experiences. On first entering a shop as an improver he was told he must join the union or go; his objection to certain

clauses as to rate of wages, &c., were overruled. One of his first jobs is 60 doors to frame and panel; his mate has the same number of similar kind. The new-come's work is sent to the store-room at 2s. per door, while his mate's cost 4s. per door. This is a signal for a boycott; the new-come is called a "sweater," a "master's man," and the like. The same hand in time rises to be a stairease and handrail maker. He is told he is a fool for studying and persevering; since at this advanced work he cannot command 1d. above the standard rate of wages. He is told he is paid the standard rate, the same as those who make the commonest things. Is there any incentive to persevere under such a system to advance in the trade? The same experience followed this man to a second shop he entered. Before he had worked one hour he was asked the same question, if he intended to work all day at this "racket"? He was called "a fool for doing too much by one-half," a "pace-maker," &c., and his mates tried to limit his output; because, if he continued, the 'boss' would expect all the men in the shop to do the same. The same experience is gone through in another shop, where, after a day's labour, he was told by his fellow workmen that the job he had done should have lasted him three days. From Dundee some correspondence informs us that the "go-easy" policy is common with the tradesmen there, much to their disadvantage. Numerous other examples we could bring forward to show that the system, not the men, are to blame. There are hundreds of men whose intentions are quite honest, who are ashamed of their day's output, but have no power to alter the circumstances. They are in the hands of the foreman, who are union men. We have heard it stated that the employer is afraid to protest; that he is not master in his own workshop. The arguments on the other side must be allowed to have some weight. Trade-unions are necessary as a protection from capitalism, from the desire of certain contractors to secure work at a lower rate than is honest or desirable in the worker's interest. One correspondent also points out that the system also assists the masters in establishing a basis for prices and tendering, as the result of the rate of wages; but it is necessary, nevertheless, that the hard-and-fast rule adopted by the unions should be regulated by circumstances, so as not to restrict output. It is reasonable that the standard wage should be regulated by the earning power of men of average ability, instead of representing the highest efficiency, so that the best workmen should obtain a just reward for their superior qualifications and ability. Writing on this point in the *Times*, Mr. William Emerson observes: "No man can pervert and bastardise the powers and energies with which he has been endowed by working in a way which sacrifices time, talent, labour, honour, principle, and love, at the altar of Mammon, without the most moral deterioration." On the bricklaying side, one champion of his craft, "A Bricklayer's Labourer" has something to say about the master builder as he is found at Newcastle: how he beguiles poor "bricky" into breaking his trade rules, and do so many hundred yards of brickwork at 2s. 6d. per yard. The writer refers to the hundreds of flats built in Newcastle. He says: "The finance companies advance \$0 per cent. of their assessed value, which is £400, the builder pays all wages, materials, and gets his own profit out of it. The companies then take them over, and sell them for £625 to £680, or make two-thirds as much profit as the whole cost of labour and material." The lesson is obvious: the workman is very much what his masters have made him. The fact is, the equality of the wage system is the product of the labour combination, and leads to the limitation of output, to the degradation of the standard of labour.

Equality of wage means, of course, the lowering of the labour of the whole to the standard of the least efficient; but, as Mr. Ralph Neville observes, trade-unionism is a result of the necessity of combination for the protection of labour. The workman is "not more nor less patriotic than his employer," as we have seen above. Both like to get as much and give as little in return as possible—in short, the condition of the workman is what the conditions of his work have made him. As we have argued before, we must try to make the worker interested in his work, give him a personal and intellectual desire in the production—there is no other way.

THE SOCIETY OF ARCHITECTS.

THE first ordinary meeting of the seventeenth session of the Society of Architects was held at St. James's Hall, Piccadilly, S.W., on Thursday evening last week, the President, Mr. Siffrant, Trevel, F.R.I.B.A., J.P., in the chair. The secretary, Mr. C. McArthur Butler, F.R.S.A., read a list of nominations, including the names of three gentlemen proposed as hon. members, four as ordinary members, and two as students. The following were elected by ballot.—As members: W. L. Tarrant Bowles, Victoria-street, S.W.; W. J. Dunham, J.P., 10, Norwich; P. Sidney Paris, Croyborough, Sussex; S. Arnold Kelly, Shanghai; S. Davidge Pitts, Cape Town, S.A.; E. J. Selwoge, 22, Surrey-street, Strand, W.C.; Christopher Simpson, the Avenue, Leigh; J. A. Souttar, 41, Bishopsgate-street, E.C.2; and J. W. T. Trollope, the Esplanade, Madras. As Students: S. C. Baggett, M. B. Collins, T. J. Edwards, and W. G. Watkins. The balance-sheet for the past year, which showed a total surplus of £543 9s. 1d., was adopted, on the motion of Mr. J. R. Maxwell.

The President then delivered his opening address, of which we gave a summary in our last issue, pp. 717-8.

A vote of thanks was proposed in cordial tones by Mr. Walter W. Thomas, of Liverpool, vice-president, who referred to the improvements in hand and in contemplation at Liverpool, which include the new workhouse, the proposed cathedral, public baths, and street widenings, would aggregate some millions of expenditure. He emphasised the value of the four great reforms advocated by the President in his thoughtful and practical address—viz., the proper qualification of architects, statutory registration, ancient lights, and a more secure land tenure. Mr. G. Gard Pye, London, Vice-president, seconded the motion, remarking that the President had not spoken at all too strongly on the necessity for a general scheme of metropolitan improvement. The difficulties and losses caused by overlapping authorities, ancient lights, vested interests, and the short leasehold system of land tenure were very great. Mr. J. W. Dyson, of Newcastle-on-Tyne, endorsed all that the President had said about the need to remind architects of the duties they owed to their clients. The motion was supported by Mr. W. R. Mallett, of Bromley, which was carried by acclamation.

It was unanimously resolved that the gold medal of the society be presented to Mr. T. Walter L. Emden, past-president, in recognition of the great services rendered by him to the society while occupying the chair during the past four years.

The President announced that the next meeting of the society had been unavoidably postponed from Thursday, the 12th inst., to that day week, December 19th.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary fortnightly meeting of the Association was held on Friday evening at 9, Conduit-street, W., the President, Mr. W. H. Smith-Smith, F.R.I.B.A., occupying the chair. Mr. R. H. Weymouth was unanimously elected to the vacant seat on the Committee, and Messrs. E. G. Dawson, D. N. Paddon, and A. Pomerooy were elected by ballot as ordinary members.

THE NEW PREMISES FUND.

The President remarked that further donations had come in to the fund for providing new premises, and that the Committee would especially welcome contributions of a guinea, as testifying

to the interest taken in the movement by the great body of working members of the Association. Since he announced the progress of the fund last fortnight previously the following additional sums had been promised:—The Architectural Association, £1,000; Mr. Basil Channery, B.A., £50; Mr. Henry T. Hare, £50; Mr. John Belcher, A.R.A., £25; Mr. Francis Hooper, £10; Mr. A. Stull, £10; Mr. H. H. Spence, £3; Mr. E. A. O. Clodd, £1 1s.; Mr. E. E. Reynolds, £1 1s.; Mr. H. T. Hather, £1 1s.; Mr. P. J. Turner, £1 1s.; and Mr. Stanley Towne, £1, making a grand total of £2,835—an announcement received with applause. The President added that efforts must be made to raise the required sum of £3,000, and that the Association was prepared to go into new premises at the end of two years, or to renew their present lease of 56, Great Marlborough-street, for a further term of seven years.

Mr. R. S. Balfour announced many donations to the library, including a series of photographs of cathedrals presented by Messrs. S. B. Bolas and Co.

SOME DETAILS OF GOTHIC DEVELOPMENT.

The President said that Mr. Francis Bond, being unable, owing to ill-health, to give his promised lecture on "Capitals," Mr. Arnold B. Mitchell had kindly taken his place at short notice. Mr. Mitchell said he proposed to address the members of the younger members, and to endeavour to illustrate by lantern slides the growth and development of some features of Medieval buildings. He would first deal with the triforium, than which no stage of a building received more care and thought in treatment from the builders of our Gothic edifices. By a short series of photographs thrown on the screen he demonstrated how the triforium was developed step by step, until it reached the culminating point of interest, grace, and beauty in the beginning of the 14th century. Its evolution was due to no sudden inspiration, but all the gradual processes could be traced had we a sufficient number of examples to draw upon. The Early Norman work in the north transept of Winchester exemplified the use of coupled arches under a plain tympanum. The whole effect was simple and indeed crude, showing a restriction to the elementary forms of structure. The tympanum was built up of small stones in the ordinary masonry of the wall, showing the coarseness of the stones and the coarseness of the mortar joints were painfully obvious. In the triforium at Chichester Cathedral we saw work a few years later in date, and certainly more advanced in treatment. The outer walls show a plain roll moulding, and the courses of masonry in the great thickness of walling were made to tell by recessing each successive ring of stone, so gaining a play of light and shade which greatly enhanced the effect. The builders still, however, wasted much material in their walling, enormous masses of stone being consumed in constructing thick masonry of little stones set at random. The simple roll moulding and the recessing of the courses certainly heightened the effect. A further improvement, also exemplified at Chichester, was to fill the tympanum with stones set lozenge fashion on edge, thus making the masonry which was not giving structural support to the mass more ordered in plan. At Early English Salisbury, a circular piercing was made through the tympanum, and the diaper was given a relief, while at Rochester this treatment was further exemplified. Mr. Mitchell proceeded, by photographs from Salisbury and Lincoln, to mark the gradual development of the style into the pointed arches, pierced with, and undercut filigree carving of the 13th century. Lincoln Cathedral, he showed, was a perfect picture-house of the development of 13th-century Gothic. The work there might be divided into three periods, all comprised within the same hundred years, but entirely distinct. The main part of the choir represented the first period we call Early English style; the eastern part of the nave was added about twenty-five years later, and eastward of the choir was the retro-choir, which showed the culmination of the 13th-century style, so that the whole rise and progress of architecture during this eventful century was exemplified, as they say, in the one minister. Not only in the retro- or angel choir, the latest portion, were the arches widened, but the carvings were more free, and the proportion of voids to solids increased: the bases of the lower part of columns were set up so as not to be cut off when viewed in perspective from below. At Westminster Abbey they saw this treatment

carried a step further, and the arched in the triforium was doubled, so as to give greater richness and intricacy of effect, and the inner panel of columns was raised so as to correct the optical effect as seen from the floor level. Illustrations of Salisbury and of Northwold's Choir at Ely were also shown. Turning next to figure sculpture, Mr. Mitchell exhibited a view of the well-known Late Norman front at Winchester Cathedral, with its distorted, archaic, but vigorous figure-carving, and passed on to the much more refined work in the Chapter-house at Salisbury illustrating the story of Adam and Eve, and another in the same series, flanking the building of the Tower of Babel, the latter showing the dress and the inclined gangways of planks, with little fillets of wood, and the small stones balanced on head or shoulder in use by English workmen of the 13th century. From these there was a great advance to the work in Lincoln retrochir and the foliage capitals in the same order. These capitals were some of the most ornate ever carved, they were deeply undercut and executed in a most intractable and brittle material, Purbeck marble. Still more elaborate was some of the work in Southwell Chapter-House, where, behind a little oak-tree carved in a capital, we found, almost invisible, in the recesses, a row and litter of pipes, barely 2½ in. in height, and quite hidden away in the subaltern foliage.

The lecturer next traced the history of a capital, from the first rude square block in a Northamptonshire Anglo-Saxon church, in its gradual refinement and development in examples at Sompting Church, Peterborough, Durham, and Rochester Cathedrals, Senner Church, and that of St. Leonard's, Stafford, to the perfection of graceful foliage carving at Lichfield and Lincoln Cathedrals. The growth of the doorway was traced in similar manner from the Norman examples at Lincoln to that at Skelton, near York, the Prior's and Monks' portals on the south side of Ely Cathedral, and so forth at Barfreston. In conclusion, Mr. Mitchell told the story how in the little village church at Copford, near Colchester, a few traces of fresco were found a few years since, and step by step the internal walls had been carefully cleansed of successive coats of whitewash, until the whole internal wall surface was found to be treated with polychromatic decoration in rich hues of red, blue, green, and gold, and by careful repair on the old lines the brilliant effect of a Medieval interior, blazoning with colour and gilding, has been restored.

A short discussion followed, in which the President, Mr. Alexander Wood, M.A., Mr. T. H. Budge, and Mr. P. G. Maule took part, and a cordial vote of thanks was passed to Mr. Mitchell for his interesting and eloquent address, which had been delivered without note. In reply, Mr. Mitchell said they had spoken highly of the books, but he had selected all of them from their own valuable collection, and chiefly from those which were recently given them by Mr. Gardner.

HOUSING SCHEMES FOR MANCHESTER.

THE inception of the Manchester Corporation housing schemes, to which public attention has again been drawn by the suggested alterations in the plans of the houses on the Blackley estate, may, says the *Manchester Guardian*, be traced back as far as 1881. The council some time later appointed a special committee, who eventually carried out two schemes—one the Manchester "Poorer's" Dwellings Scheme, 1890, and another the Manchester Dwellings for Construction Act, 1891. By these schemes provision for persons displaced by the pulling-down of insanitary premises was met by the erection of corporation dwellings in Oldham-road, Pollard-street, Chester-street, Port-street, and Harrison-street, under the Local Act of 1897, upwards of 5,965 houses had been erected by the end of 1899, and only 2,776 had been substituted, although some time before £250,000 had been spent on the various schemes for the better housing of the people.

When, therefore, an opportunity came for the purchase of an estate in Higher Blackley and within the city boundary, which a branch railway already proposed to the Lancashire and Yorkshire Company and the approaching adoption of electric tramsways promised to render more accessible, the sanitary committee recommended this site as a means whereby a considerable number of people could be accommodated with dwellings. The estate was a large one, covering about 277 acres, and it was offered to the corpora-

tion for £36,000, or about £150 an acre, including all the mineral rights. The recommendation of the committee was adopted by the council. The Local Government inquiry into the application for borrowing powers was held in April of last year, and on that occasion Mr. Adamson M'Dougall, deputy chairman of the sanitary committee, in supporting the application, said the fact that the corporation were providing suitable houses for tenants of the working class in a healthy part of the city accessible to and from the centre by tramways and a railway would expedite and make more practicable the removal of insanitary properties. Of this land at Blackley it was intended to set apart about fifty acres for allotments, and the rest would be available for houses. The application was granted, and since that time the committee have been busily engaged with plans and schemes for making the best of their purchase. The estate will in process of time be reached from the one side by a proposed tramline, which is to begin at the top of Chatter Hill-road, skirt Heaton Park, and probably proceed to Middleton through the village of Rhodes. On the other side a projected tram route is to join the corporation system at Blackley, and proceed north-west in an almost straight line to Middleton by way of Rochdale-road. At Middleton it joins on to the other line. The route by Middleton-road will pass the Blackley estate at Rhodes, and that by Blackley will skirt the other side of it for some distance. Then there are the projected Manchester and Middleton Railway, with a station at Blackley, and the approach by Boothroyden-road, near Rhodes.

With regard to the laying out of the estate, two separate schemes have been prepared, but the full details of neither scheme have as yet been made public. The latest proposal, which has not as yet, however, been finally adopted, is to follow the plan of a similar scheme for the erection of model cottages at Leek, in Stafford-

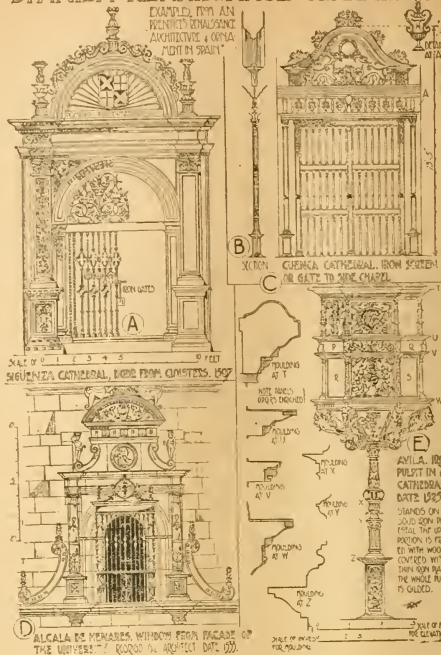
shire. In that scheme, which finds considerable favour with the Manchester authorities, the houses are built in blocks of about ten dwellings. The exterior is of red brick, and each house has a garden behind and before about 15 ft. wide, over which in the front elevation bay windows add. A yard about 11 ft. square contains a covered recess for coals, with outside offices. The kitchen, which overlooks the yard, is 14 ft. long and 12 ft. across in its widest and 9 ft. 6 in. in its narrowest part. There is, too, a parlour or sitting-room, about 14 ft. by 13 ft., except where the lobby for a short distance occupies 8 ft. of space. The houses have a scullery and pantry, with bath and provision for hot and cold water. The sleeping arrangements are, for cottages, commodious. There are three bedrooms, two of them about 10 ft. by 14 ft. and 9 ft. to the ceiling. The middle bedroom ceiling is raised to a height of 11 ft. 6 in., to make up for its smaller dimensions, which are slightly restricted by the stairhead. Behind the blocks there is a road for carts, 18 ft. wide, whilst in front the plans show an avenue in which trees might be planted, and which is 60 ft. wide. Between three and four hundred houses will be erected from the set of plans the committee may finally decide to adopt.

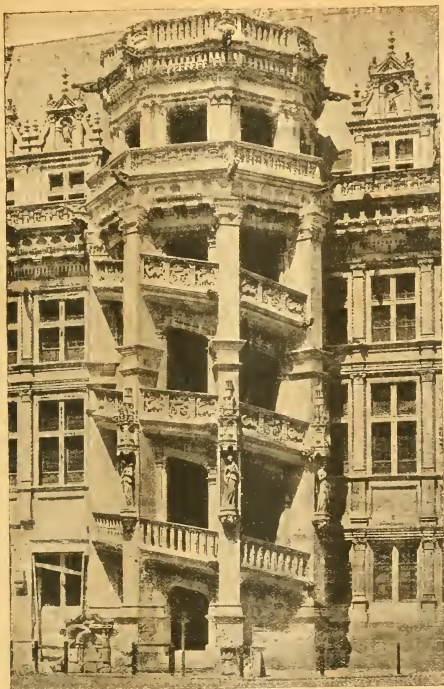
A HISTORY OF ARCHITECTURE.*

THE fourth edition, which has now been published, of the late Professor Banister Fletcher's "History of Architecture," assisted by his son Mr. Banister F. Fletcher, establishes the fact that the volume has supplied a want among students and others by bringing into a comparative form the essential differences and character-

* A History of Architecture on the Comparative Method, for the Student Craftsman and Amateur, by Professor BANISTER FLETCHER, F.R.I.B.A., and BANISTER F. FLETCHER, A.R.I.B.A. Fourth edition, revised and enlarged. 1901. London: B. T. Batford. 21s. net.

SPANISH RENAISSANCE ORNAMENT.





CHATEAU DE BLOIS: FRANCOIS PREMIER STAIRCASE.

istics which mark the styles of successive ages and various peoples. The thick book into which this treatise has now grown, marks more than the mere increase of its size, which soon will emulate the bulky proportions of our once familiar friend (Twilt's) "Encyclopedia." The history now boasts of a note on Prehistoric architecture; its chapters on each style have been rewritten so far as the remarks on their architectural character is concerned; a note on the religious orders of the Middle Ages is given in the chapter, dealing with the Romanesque Architecture of Europe, and in this connection the Gothic architecture of Europe is furnished. The roofs of Medieval buildings are referred to more fully, and so with English parish churches, castles, and Domestic buildings of the same period. Irish and Scottish architecture, as well as Indian, Chinese, Japanese, and Saracenic are now taken into account, necessarily, however, by little more than a reference. The illustrations have been largely amplified, now numbering 256 plates; of these 128 are reproduced from photographs representing typical buildings, and 128 are from drawings specially prepared for the book in illustration of parts, and characteristic details of the various styles. The index merits the name, and the glossary has been rewritten and expanded. Such, in brief, are the differences which distinguish the alterations set forth in the preface, and to this we may add that the system of classification for each style occurs under Geological, Geographical, Climatic, Religious, Social, and Historical influences. Then architectural character is considered, with examples, and a comparative digest of plans, walls, roofs, openings, columns, mouldings, and ornament. We shall do better not to attempt a further synopsis of such

an undertaking, and while we miss the individuality of a Fergusson, which gave such personality to his "History of Architecture" (before others edited it), we can but admit that the present volume is brought more in accord with the methods of the schools, and its information is presented in a way adapted to more ready reference, with compact records of leading facts and dimensions in a variety of cases which would otherwise occasion much labour to look up and annotate. The amount of information got into some of the crisply-drawn plates is really quite remarkable. This leads occasionally to the appearance of overcrowding; but it has the advantage of leaving the interstices clear of marginal diagrams. The photographic plates are capitally reproduced and well printed. We are enabled, by the courtesy of Mr. B. T. Batsford, the publisher, to accompany these notes with three specimen examples. The first of these well-known subjects which we have thus selected is the Emons Staircase from the Chateau de Blois, erected by Louis XII. and Francis I. during the early years of the 16th century, one of the finest buildings of the French Renaissance. From Spain we have elected to give the Town Hall at Seville, which, added to in later times, may be reckoned as one of the most refined and interesting examples of the Spanish Renaissance. The "Patio," the characteristic feature of the domestic buildings of Spain, is charmingly represented by the photograph from the House of Miranda at Burgos. Here the bracket capital is well illustrated. Several of Joseph Nash's drawings are reproduced in connection with the English Renaissance. The brief record of the 19th century included under the same heading is made inclusive of the Gothic school, and many

architects of more or less contemporary fame are mentioned with some of their works. In this respect some notable buildings are overlooked; but this possibly is inevitable, while in others one man's work is allocated to another, as the Greek Church, Bayswater, by Mr. John O. Scott, is attributed to his brother, the late Gilbert Scott. The list of references to standard books under each section enhances the utility of this eminently comprehensive volume, which would be more handy if divided into two.

THE IDENTIFICATION OF WOOD.*

THE subject of my paper presents a field in which the greater part of the ground is unbroken. The chief contributions to the branch of botany have been made by students of forestry, and it is to Germany that we must look for information. The two Hartigs and Franz Schwartz have dealt with the European trees in a fairly complete manner, and Mayr has made some important contributions to the anatomical characters of the conifers of North America; but foremost stands Nordlinger, who has described the structure of no less than 1,100 species of timber trees, and whose series of sections is the wonder and admiration of the few who have seen them. J. S. Gamble's "Indian Timbers" is a fine work, and the only one which is published in the English language (saving a translation of a small brochure by Theo. Hartig). His collaborator, Sir Dietrich Brandis, who did the descriptive work for "Indian Timbers," is perhaps the chief living authority on the subject. A magnificent series of 200 sections of American woods, published by Romeyn B. Hough in the United States of America, is another substantial aid; but, unfortunately, his descriptions accompanying the sections testify that the author is unaware of the significance and value of his own specimens. In all these books there is nothing approaching a scheme of classification. The nearest is contained in the notes accompanying the descriptions in J. S. Gamble's "Indian Timbers," but as they are based exclusively on the local species, they are quite useless when applied to timbers of other countries. All other authors confine themselves to isolated descriptions of species, with an artificial key as a guide amongst chaos. The old rule-of-thumb method sufficed until foreign timbers began to be imported in increasing variety, which, in proportion, restricted the possession of expert knowledge to the few. The carpenter knows the woods he works with from continually handling them, and can, perhaps, distinguish a dozen or twenty of them with ease. Beyond these he is at sea. The timber-merchant dealing in hardwoods has a longer list of familiar woods and, having spent his days amongst them, becomes an authority upon them. But the process of handing a strange piece of wood round until someone is found who knows it is a part of the daily routine even at the oldest houses. When, as often happens, a species not previously met with turns up, even the most expert are helpless, and they will be the first to admit that some means which will ease out their experience is desirable. Many hundreds of consignments of excellent timber reach our shores, and failing sufficient information as to their name, origin, and virtues, are passed by purchasers until they are finally relegated to the rummage sale. To base the art of identification upon a secure foundation it is absolutely necessary to obtain authenticated specimens. I have, therefore, appealed to the Colonial Office for authenticated specimens of all Colonial timbers, so as to enable our colonists to recognise their own woods and, having spent farer in new countries. Besides this, our settlers had a limited knowledge of English trees when they left their shores, consisting of a few names, such as oak, beech, ash, elm, pine, &c., and every tree they met with in their colonies was a variation of a few simple adjectives, such as red ash or black ash. When these became exhausted, the alternatives are red wood, white wood, yellow wood, iron wood, and the like, hence in different parts of Australia no less than five distinct species of eucalyptus pass under the name of Red Gum, and two or three under Blue Gum. By the present Colonial Secretary's recommendation of my petition to the various Colonial Governments, I have already obtained promises of authenticated specimens of the woods of Canada, of

*By HERBERT STONE. A paper read before the Society of Arts, Wednesday, December 4.

Andrew's: Calciferous Sandstone, Raised Beach. The rocks on the north of this county are lavas and tufts of Old Red Sandstone Age. On the east and south they are Carboniferous, with intrusions of Basalt. All the divisions of the Carboniferous series are represented—viz., Coal Measures with red sandstone; Millstone Grit, a coarse sandstone with conglomerates; and calciferous Sandstone, which passes gradually down from cement stones and streaks of coal to the red and yellow sandstone of the Upper Old Red. Carboniferous times in Fife were marked by wonderful volcanic eruptions, each followed by basins of intrusive agglomerate, each of which indicates the locality of a volcanic vent probably Permian times. Felspars form the bases of all igneous rocks, Hornblende and Augite hold the next important place: they differ a composition, structure, and texture. The same minerals, combining in different ways, or they will assume different appearances in structure and texture when cooled under different conditions for instance, the silicates, which, when combined in a molten state, form transparent glass, will also form an ordinary slag or crystalline stone; all the igneous rocks found interbedded with the sandstone. The various deposits of this county are now solid stone. The building stones of this county are sandstones of the Carboniferous series. The principal quarries are: Grange, Burntisland, Messrs. Baird and Stevenson (90 men); Humber, Aberdeen, Mr. T. Lochie (32 men); Newbigging, Aberdeen, Messrs. Chalmers (18 men); St. Andrew's, Messrs. A. Fraser and Son (7 men); Swallowdrom, Dunfermline, Mr. J. Stewart (15 men); Sands, Kincardine, Messrs. G. and R. Cousin (14 men); Rosebank, Dunfermline, Mr. W. Birrell (13 men); Don, Kirkcaldy, Messrs. A. Fraser and Son (12 men); Kembark, Mr. Mitchell (10 men); Berrylaw, Dundee, Messrs. D. Dick (9 men); Smeaton, Kirkcaldy, Messrs. A. Frazer and Son (6 men); and several others employing less than 6 men. The Rosedale limestone quarry is worked by Mr. J. J. Baird with 3 men, the stone being used for lime-burning. A quarry at Chacevay produces a soft white stone, and the quarry at Abernethy, near Perth, produces a white, though quarried white, turns black on weathering. Many of the Scotch Carboniferous sandstones change colour on being exposed to the atmosphere for a year or more, so that a stone should be judged for colour from a weathered specimen and not one taken recently from the quarry. Old Red Sandstone is quarried extensively worked, but there is a large quarry in it at Cupar Muir, worked by Messrs. Finlay and Sons, Basalt (Whinstone) is quarried at Inverchicht, Ferrytoll, North Queensferry, and several other places. The composition of Basalt may be compared with granite and pumice-stone, both of which forms of igneous rocks are familiar to the builder, in the following table:—

	Basalt.	Granite.	Pumice-stone.
Silica	48.9	68.44	62.72
Alumina	13.8	16.02	14.12
Iron oxide	13.3	1.25	2.25
Magnesia	6.5	3.98	3.74
Soda	7.0	0.93	4.21
Potash	1.3	1.46	0.53
Iron oxide	13.8	3.33	6.81
Water chloride	—	—	2.41

The proportions of the mineral constituents varied in different specimens of the same rock, and rocks having the same chemical composition may vary considerably in structure and texture.

FOURTH.

The rocks in this county are Old Red Sandstone (349, 353, 354, 361, 362, 364, 367, 368, 380, 398, 401, 402, 404, 406, 412, 414), Dalriadan Metamorphic sedimentary strata with eruptive rocks, Basalt, and Porphyry. Arbroath is built on Old Red Sandstone and a raised beach. Dundee is similarly situated, an eruptive rock, diabase (being common in this locality, Diabase is an altered basalt). Forfar: Old Red Sandstone, Conglomerate, Alluvium. Montrose: Raised Beach, Alluvium. Roughly speaking, a line from Lintrathen by Corthay to Edzell divides the Dalriadan rocks of the north-east of this county from the Old Red Sandstone of the south-west. The former are altered Schisto-gneiss, and Quartzites, except along the line of junction with the Old Red Sandstone, where they

are unaltered clay slates, interbedded with coarse and fine sandstones. The lower Old Red Sandstone, which is over 20,000 ft. thick in this and the adjoining county of Kincardine, is chiefly represented here, the only exposure of upper Old Red being a small area to the north of Arbroath. The only building stone in the county is Old Red Sandstone, excluding, of course, such stones as are suitable only for walling. The Old Red Sandstone of England and Wales is by no means a reliable weather stone, but the Scotch varieties are apparently more to be depended on, for speaking of the "Old Red" in the spirit of Brechin Cathedral, R. Hunt says: "It has stood for 800 years without decay," which is more than can be said for any spar built with Old Red Sandstone in England or Wales. Taking that in all Saints, Hereford, for instance, as an example, the ribs at the angles of the octagon have been "restored" several times by knocking them off to prevent the congregation being disturbed by specimens of the Hereford Old Red coming through the roof of the nave during divine service. There are several quarries in the sandstone of this county, and they yield pavement and block stone. The pavement is sold at the superficial foot according to thickness, which varies from 2 in. to 4 in. Polishing and pointing are charged extra. There are two classes of pavement, the second-class generally selling for 1d. per foot less than the first-class. Blocks or "sized" stones are also sold by the superficial foot, the thickness varying from 4 in. to 9 in., and the area from 16 ft. to 80 ft. Steps are also turned out of the quarries ready worked or "dressed." These may be "dressed on tread and sawn on breast," "dressed on tread and plain-breasted," or "dressed on tread and bottled." They are to be had from 3 ft. to 12 ft. long, and from 6 in. to 18 in. thick, the thickness according to thickness, ring steps, step corners, and platts are also produced in the quarries, many of which are fitted up with modern stone-working machinery. The chief quarries are:—Slade, Carnyllie, Messrs. Duncan, Falconer, and Co. (105 men); Duntrane, Dundee, Messrs. Morrison and Son; Wellbank, Montrose, Messrs. Galloway and Co.; Westhall, Dundee, Messrs. J. Morrison and Son (79 men); Leuch, Dundee, same quarryman as last; Myrton, Dundee, Messrs. Langlands, Ltd. (51 men); Rossmill, Mains, Messrs. J. and W. Dargie (51 men); Leysmill, Inverkeilor, Mr. J. K. Esplin (44 men); Fallow, Rossmill, Messrs. J. and W. Dargie (36 men); Dalrymple, Monkrie, Messrs. Nairn Bros (36 men); Balgavies, Aberlemno, Messrs. Calder Bros (31 men); Middleton, Kirkcaldy, Mr. W. K. Esplin (30 men); Ley, Kettins, Mr. D. Reid (28 men); Charleston, Leche, Mr. J. Bruce (23 men); Hill Head, Brechin, Mr. J. Baxter (12 men); Hill Head, Brechin, Mr. J. Baxter (12 men); Ald Bar, Brechin, Mr. D. A. Crath (10 men); Brax, St. Vigens, Mr. A. Fleming. There are numerous "Whinstone" quarries, all of which are worked by public bodies for road repairs. "Slates" were formerly quarried at Hoyston and Turin, near Forfar. These were really thin sandstones, and not true slates, the bedding of which is produced by slaty cleavage. In Old Red Sandstone quarries a bed of stone may be fissile, and suitable for paving or stone tiling, while the underlying bed is apparently a block stone. The latter, when exposed to the weather, will probably fall by splitting in thin plates, but the presence of mica flakes which are interbedded with the sand grains at regular intervals: hence every fine-grained micaceous sandstone, whether red or grey, should be looked on as an unreliable weather-stone.

FIFTH.

The rocks in this county are Carboniferous Limestone with coal seams, Calciferous Sandstone with thin beds of sandstone, and conglomerate, Gneiss, and shales of the same age as the Welsh Llandovery and Cardaroc rocks; Granite, Basalt, Felsstone, Porphyritic lava and tufts, with coarse breccia. Dundee is built on calciferous Sandstone, Felsstone, and Old Red Sandstone. Haddington: Carboniferous Limestone, Alluvium, and Porphyry. Carboniferous Limestone is the work of this county is occupied by Upper Carboniferous rocks; the lower division is found north and east far as Dundee, that portion above Haddington being much altered by the intrusion of igneous rocks. Similar rocks are found along the coast by gullies, Dundee and Cockburn in the Old Red Sandstone runs south from Dundee into Berwickshire, and south-west to Edinburghshire, where it borders the Moorfoot Hills. Silurian

rocks occupy the south-east of this county in the Lammern Hills. The Silurian strata are everywhere much disturbed by the intrusion of volcanic rocks; there are great tracts of these, consisting of felsstones and felspathic ash interbedded with the calciferous Sandstones which occupy the greatest surface area in any part of the county. With one exception none of the quarries in this county employ more than five men; the districts are therefore not remarkable for its building stones, which have at present only a local interest. Several quarries which were extensively worked for 30 years ago have disappeared from the "live" quarry list, as they are situated in the three or four at Brechin, Arbroath, Penicuik, Leuch, Peppercraig, and St. Andrew's. Carboniferous Limestone is quarried at Broomfield and Cattergus near Dundee, by Messrs. P. Mitchell and Sons, who employ about 10 men in both quarries, that at Cattergus being the most extensive in the county. Calciferous Limestone is quarried at Sand, 11 men, Mr. A. Wilson, 5 men; Links, Gulland, Messrs. A. McGreya 5 men; Broomfield, Dundee, Mr. G. Cunningham 5 men; Kirkcaldy, Tranter, Messrs. Baxter and Co. 3 men; Presburgh, Prestons, Station Quarry, Dundee, Mr. J. G. Fraser, 3 men; Messrs. Wilson and Sons 1 man. The calciferous Sandstone rocks are not so well developed in this as in the adjoining county of Edinburgh, and here they pass down uniformly into the Old Red Sandstone, from which they are distinguished by a difference of tint. The Old Red Sandstone belongs to the upper division, and consists of red and yellow sandstones similar to those found in Berwickshire and Fife. Conglomerates of the same age are common in these rocks. Like the underlying Silurian strata the Old Red is used chiefly for rough walling, and in steps, and dressed work, or where there is not much labour. The red rocks are elsewhere worked for road-metalling.

INVERNESS.

The rocks here are Gneiss, Upper, Middle, and Lower Lias (in Skye), Carboniferous Limestone, Old Red Sandstone, Turridon Sandstone, Dalriadan Gneiss, and Schistose rocks, Quartz Porphyry, Gabbro, Basalt, and other igneous rocks. Inverness is built on Alluvium and Old Red Sandstone; Portree (Isle of Skye) on Basalt. This county is of very irregular outline, it includes a number of islands, and the only part of the Hebrides except Lewis. The mainland is almost wholly occupied by metamorphosed Dalriadan rocks, which are here quartzose micaceous flagstones with occasional beds of crystalline limestone and Serpentine. In numerous places these Silurian strata are broken through by massive intrusions of granite. Old Red Sandstone extends to a comparatively narrow belt from Moray Firth along the east side of Lochness to the Falls of Foyers. It is found again along the eastern side of Loch Oich. The whole of the centre and north of Skye is Basalt, in the south of this island Lias, Carboniferous Limestone and Turridon Sandstone are developed. Altered sedimentary and igneous rocks are also common in this and the adjoining islands. Old Red Sandstone is quarried at Blackton, Dalwhinnie, North Cameron; Drum Temple, Inverness, Mr. D. Macdonald; and Hillhead, the Earl of Argyll. These are the only quarries in the county of note, and they give employment to few men. For making lime a limestone was worked at Broadford, Skye. The granite of Fingask was used in building Loch Ness Bridge, and that of the island of Eboray in the dyke at St. Peter. The "Old Red" of Galloway is quarried at Broadford for Inverness Exhibition Hall, and a whinstone from Mucknoe, in the Union Hotel, Inverness. Notwithstanding its great area, there is no building stone quarry of any importance in the county.

DECORATION AND DECORATORS.

UNDER the auspices of the Northern district of the Incorporated Institute of British Decorators, a lecture was delivered on Saturday, Mr. Geo. C. Haile, of Sheffield, the subject being "Decoration and Decorators: A Survey of the Past and Present."

In the course of his lecture Mr. Haile dealt chiefly with the domestic aspects of decoration, referring to it as the most important and the most interesting, the most impressive, and the most useful of our lives—the days and hours of our childhood; the art which is associated with filial devotion and love, and which beautifies the surroundings of the

PRICES.—LEAD WORK.

Description.	s. d.	per cwt.
Mild steel sheet, supplied only	17	0
Riveting and remilling old lead, or exchanging new lead for old, 4lb. to 6lb. being allowed per cent. for waste and dirt	6	6
Add to two last items if cut to dimensions required	1	6
Lead and pipes in laying or erecting, exclusive of soldered joints and trials	4	6
Mild steel in and laying in gutters and fittings, etc.	21	2
Ditto in flashings to parapets	25	4
Sheet lead taken up and reworked to store (free iron bailing, 1lb. apart, to lead or zinc)	1	6
Ditto zinc, ditto	0	2
Ditto copper, ditto	0	3
For open nailing deduct 50 per cent. from above	0	2
Soldering joints (1lb. to 2lb. of solder per foot), labour and materials	27	6
Flashings, bedding in white lead labour and white lead	1	1
Running in lead in masonry including lead and fuel	0	8
Welding flashing with lead	0	8
Labour to walt	0	2
Ditto double	0	3
Dressing to 1 1/2 in. rounded edges	0	2
Soldered seam	0	8
Soldered angle	0	6
Extra labour and solder to resolder	3	6
Soldered tanks or cists, including screws	27	6
Boiled ends to rolls	0	3
Intersection of two rolls	0	9

Description.	s. d.	per cwt.
Patent or drawn pipe, 2in. and under	18	9
Ditto, above 2in.	21	5
Soldered sweep pipes and bends	27	6
Haines' patent lead encased black-tin pipe	33	0
Fixing pipes, including holdfasts, but exclusive of soldered joints	4	0

Description.	Materials.	Labour.	s. d.	per ft. run
1in. lead pipe, midding	0	6	0	2
1in. ditto	0	9	0	3
1 1/2 in. ditto	1	9	0	4
2in. ditto	1	6	0	5
2 1/2 in. ditto	6	9	0	9
3in. ditto	2	4	0	8

Description.	Materials.	Labour.	s. d.	per ft. run
Add for bends in drawn lead pipes, 1in. to 1in. diam.	each	0	6	0
Ditto ditto 1in. to 2 1/2 in. diam.	each	0	9	0
Ditto ditto 2 1/2 in. to 3in. diam.	each	0	9	0
Ditto ditto 3in. to 4in. diam.	each	1	9	0
Soldering joints and fire, 1in. pipe	each	1	0	0
Ditto ditto 1 1/2 in. pipe	each	1	3	0
Ditto ditto 2in. pipe	each	2	2	0
Soldered ends to 3in. pipe	each	2	4	0
Old lead pipe taken up and removed, exclusive of digging	per lb.	0	0	0
Covering pipes up to 2in. diam. with two thicknesses of hair felt, bonded on with tarred twine	per yd. run	0	6	0
Bedding joints in cast-iron socket siphon pipes, including lead, gasket, fuel, and all labour	each	1	2	0
1in. soil-pipe of 7 1/2 in. lead, with collars, joints, and fixing	per yd. run	2	11	0
Extra for bends in ditto, about 2ft. cist. long	each	6	4	0
Extra soldered joints in ditto	each	3	0	0
For air-pump, 1in. dia. diam.	each	13	6	0
For air-soil-pipe, and fixing	each	4	5	0
Connection of soil-pipe with drain	each	4	5	0

Description.	1in.	2in.	3in.	4in.
Drawn lead pipe, for S. 8lb.	s. d.	s. d.	s. d.	s. d.
Lead soil-pipe, each	2 11	9 3	6 7	3 9
Ditto, with brass screw plug	2 11	6 6	3 8	0
Add if fixed, including one soldered joint	3	0	4	0

Description.	3in.	4in.	5in.	6in.	7in.	8in.
Round closet valves, with screws, nuts, and unions	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Washers and gaskets for each	—	—	1	3	—	—
Washers and gaskets for lead	1	0	1	2	6	1
Ditto with screws or nuts for iron and steel valves, screwed for iron pipe	2	8	4	0	3	10
Ditto with unions for slate valves	3	7	4	15	3	10
Add to foregoing if fixed, including soldered joint	1	6	1	2	13	1
Washers and gaskets for lead	1	8	10	2	3	3
Washers and gaskets for lead	1	0	1	8	1	2
Add if fixed, including soldered joint to waste	1	6	1	2	3	3
Soldering in brass gaskets	0	4	0	3	0	7

Description.	s. d.	per cwt.	s. d.	per cwt.	s. d.	per cwt.
Screw-down brass bib cocks, supplied only	each	3	0	4	0	13
Screw-down gunmetal stop-cocks, supplied only	each	3	4	5	7	0
High-pressure horizontal ball valve, including copper ball and rod complete	each	2	4	5	6	1
Self-closing ball cock of approved pattern	each	5	0	12	0	12
Tyler's "The Waste-not" ball tap	each	5	0	8	3	12
Add to the above if with screwed end	each	2	0	9	1	1
Ditto ditto with fly nuts, as for boilers, slate cocks, &c.	each	5	0	13	1	1
Ditto ditto with W.T. galv. lever handles	each	5	0	13	1	1
Fixing cocks and valves, including washers, &c.	each	5	0	13	1	1
Ditto bib cocks and valves with one soldered joint	each	5	0	13	1	1
Ditto with two soldered joints	each	5	0	13	1	1
Easing, regulating, and adjusting cocks or valves	each	5	0	13	1	1
Fornales, straight or elbow, with ground union joint	each	5	0	13	1	1
Add to two last if fixed	each	5	0	13	1	1
Union joints for iron pipes	each	5	0	13	1	1
Ditto if fixed	each	5	0	13	1	1
Union joints for lead pipes	each	5	0	13	1	1
Ditto if fixed, including soldered joints	each	5	0	13	1	1
Brass screw Union with fly-nut for iron, and joint to lead pipe	each	2	6	3	4	0

Connection with Water Company's main, say 22s.

Description.	s. d.	per cwt.
The "Orington" wash-down and trap, s.o.	each	31
Whiteware pedestal, pan and trap in one	each	34
Mahogany seat	each	17
The "Avoncliff" wash-out	each	16
Trap, with vent extra	each	1
The "Eos" in one piece, white	each	25
The "Vintax," white	each	40
Ditto, raised and ornamented	each	75
Braun's spring-valve closet	each	92
Ditto, below ground	each	103
Hayward Tyler's best quality valve closets, brass fittings	each	63
Shank's "Citizen" wash-down	each	28
Hellyer's "Optimus" valve-closet, with waste preventer	each	127
Mitchell's closet, self-acting	each	16
Galv. iron brackets for closet seats	each	3
Closet seats, with hinge cover, mahogany, best quality	each	33
"Artisan" white basin and trap	each	6
Fixing only, wash-down w.c. basin and trap, with hand-cast siphon, W.W.P. eastern and brackets, and 6ft. of flush-pipe, complete	each	15
Winn's "Acme" galv. iron siphon cistern, s.o.	each	23
"The Peckham" galv. iron W.W.P. cistern, 2 gals. s.o.	each	24
Deval's patent ditto ditto	each	27
Galv. iron brackets for above cisterns	each	1
Field's self-acting flushing siphon cistern, 100 gals.	each	192
Ditto ditto 50 gals.	each	144
Ditto ditto 25 gals.	each	108
Ditto ditto 5 gals.	each	54

Description.	s. d.	per cwt.
Small angle iron, 1 1/2 in. wide, white, un-fixed	each	7
"Beard" ditto, ditto, ditto	each	23
Tyler's iron, flushing with lip	each	9
Cocks for urinals, with unions both ends	each	2
Fixing only, flat-backed urinals, including waste-pipe	each	2
Ditto angular ditto ditto	each	2
Zinc sparge pipe, 1in. diam., and fixed	per ft. run	0
Extra for stopped end	each	0

Description.	s. d.	per cwt.
Lavatory basin, white, 1 1/2 in., with overflow, s.o.	each	1
Ditto ditto 1 1/2 in., ditto	each	2
Ditto ditto 1 1/2 in., with washer and plug, s.o.	each	2
Add if fixed	each	2
Fixing only, Jennings's basins, complete	each	6
Doulton's enameled slate lavatory tops, 2ft. 6in. to each person, with 1 1/2 in. basin, plug, valve and skirting	each	37
Tripp with oval basin, 15in. by 17in. enamelled slate top and skirting	each	11
Cam-action lavatory valve, hot or cold, 1 1/2 in. diameter	each	9
Ditto ditto, silvered	each	11
1in. W.C. or galv. screw-down lavatory valve in plate ditto	each	4
1in. spring stop valve, screwed for iron	each	2
Brass flat link chain	doz. run	2

Description.	3in.	4in.	5in.	6in.	7in.	8in.
Fireclay enamelled sink, 30in. by 22in. by 10in., and fixed	each	65	6	0	0	0
Jennings's enamelled patent sink, 4in. long	each	15	0	0	0	0
Tyler's or Harst's enamel sink, 20in. by 20in.	each	32	0	0	0	0
Doulton's soap suds for hospital, enamelled	each	52	0	0	0	0
Household's soap-receiver, with slate sink and tin, each	each	9	0	0	0	0
Hayward Tyler's soap-receiver, white	each	9	0	0	0	0
John and Andrews' galvanised iron sink trap, 3in.	each	6	0	0	0	0

(To be continued.)

At St. Mary's Hall, Coventry, on Friday, Colonel C. H. Luard, R.E., held an inquiry into the application of the Coventry Corporation for sanction to the borrowing of £1,945, £245, and £510 for the respective purposes of providing a police-station, library and reading-room, and fire-station for Foleshill. There was no opposition.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A BUSINESS meeting of the Institute was held on Monday evening, at 9, Conduit-street, W., the President, Mr. William Emerson, in the chair. The following forty members were elected:—As Fellows (8): Basil Edgar Bailey, Angeword, Nottingham; John Begg, Consulting Architect to the Government, Bombay; John Cash, 28, Newman-street, Oxford-street, W.; Henry Edward Farmer, Bridge-street, Walsall; Henri Favarger, of Cairo, Egypt, and Home Lodge, Herne Hill, S.E.; John Harry Woodall Hickton, Bridge-street and Westbourne-road, Walsall; Francis Edward Massey, Union Castle Building, Cape Town; and Matthew Burn Price, 234, Longmarket-street, Pietermaritzburg, Natal. As Associates (30): Thomas Wilson Aldwinckle, 20, Deanna-street, London Bridge, S.E.; Harry Allberry, M.R.I.A.I., the Works Department, Messrs. A. Guinness and Co's Brewery, St. James's Gate, Dublin; John Percival Bick, 6, Cecil-street, London; MacDonald, 44, Cork-street, Bond-street, W.; Charles Henry Edward Bridgen, 22, Southampton Buildings, W.C.; Henry Cayley, M.A. Cantab., Whitehall-place, S.W.; Frederick Dore Clapham, Fryern House, Eltham, Kent; William Bruce Dawson, 6, Old Queen-street, Westminster, S.W.; Harry Dobson, Day, Railway Approach, and Holloway Hill, Godalming; William Mackereth Dean, 10, Norfolk-street, Strand, W.C.; Lionel Gordon Detmar, Hazeldean, Sutton, Surrey; Tom Norman Dinwiddie, of Greenwich, and 54, Parliament-street, S.W.; Leonard William Ensor, St. Peter's Chambers, Harsham, Southampton; Isaac Gammell, 3, New Inn, Strand, W.C.; Leolin Charles Gregory, 22, Southampton Buildings, W.C.; Charles Llewellyn Hall, 27, Richmond-terrace, Blackburn; John Percy Hall, 6, Victoria-grove, Kensington, W.; Sidney Joseph Halsall, St. Margaret-street, Clerkenwell; Kenneth Gibson Robertson, Cuthbert Harding, 27, Broadgate, Lincoln; Abraham Holstead, 50, Narrowgate, Alnwick; Edward Vincent King, South Shields and Normanton; Alexander George Robertson Mackenzie, 34, Meeklenburgh-square, W.C.; Ernest Godfrey Page, 3, Warwick-court, Gray's Inn, W.C.; Arthur Pickens, 26, Brixton-street, Blackpool, and Blackburn; Louis Edward Pryor, engineer's department, Metropolitan Asylums Board, Victoria Embankment, E.C.; Edgar John Pullar, 109, Victoria-street, S.W.; Arthur Henry Roe, 200, Norfolk-road, Forest Gate, E.; Reginald Bertie Rowell, Cope Chambers, Colchester; Clement Stratton, St. Martin's Place, Leicester; John George Walker, 40, Upper Baker-street, N.W.; and Raymond Clifford Winch, 16, Museum-street, Ipswich. As Hon. Corresponding Members (2): Senor Don Enrique Maria Repulles y Vargas, President of the Central Society of Spanish Architects, of Calle de San Agustín, 3, Madrid; Senor Don M. Alberto de Palacio, of Miguel Ángel 1 Hotel, Madrid.

THE NEW MODEL BY-LAWS.

Mr. Lacy W. Riddle moved that the Royal Institute of British Architects desire to thank the Local Government Board for the issue of "Model By-laws, IV. Rural Districts." While doing so the Royal Institute would urge on the Board the desirability of preparing a model to enable rural district councils to regulate party-

proof compound. Heat and sudden changes of temperature do not affect it; it stands steam, water, limes, acids, alkalis and gases, and is fire-resisting. Metal roofs are subject to corrosion, but the "Ruberoid" is invaluable to the action of all moisture and gases. The specimens were here convincing, as the "Ruberoid" is admirably adapted for all kinds of farm buildings, sheds, and outbuildings, which are required to be air and watertight, and non-conductive of heat and cold. Engine-sheds, poultry-houses, and kennels have been constructed wholly of the material for roofs and sides. The "Ruberoid" is a smooth surface, and can be employed in the erection of cheap cottages; it is of a slate colour, and admits of expansion and contraction without opening the seams like metal. One of its great advantages is that it can be laid between roof and wall like leadwork, the upper edge being tucked into a joint of the wall, chimney, or parapet; it can be laid with moulding at the seams, and used to line gutters. The "Ruberoid" is made in four weights—half, one, two, and three-ply. In each roll there is sufficient to cover 200sq. ft. of roof. Sixteen square feet are included in each roll for limes, acids, and gases, which are 2in. wide, including also the necessary nails, tin-caps, and Ruberine or cement for cementing the seams. The material is laid on board sheathing, and is 36in. wide, the seams being run from ridge to gutter. The roofing does not require painting, but a coat of Ruberine paint at the end of eighteen months will suffice. The "Ruberoid" can be laid over wetting fixed to rafters or studs set 10in. apart from centres, thus economising timbering. A building with roof and sides can thus be covered. The price per roll to cover 200sq. ft. of roof is according to the "ply," and varies from 17s. 4d. for 1-ply, to 36s. for 3-ply. We can safely recommend the "Ruberoid" roofing or covering for all farm buildings, manufactories, and sheds, as very light, elastic, and weatherproof; it can be bent over ridges or hips, and the Ruberine cement makes a strong joint. Full directions for using are given, and the testimonials from New York, Sydney, and Amsterdam, and other parts of the world attest its value. The Castle Works, Hadley, have been entirely covered with this material, and it is, we believe, specified for the East Anglian Cold Stores and the Riding School at Cardiff. The "P. and B. Paint," which has a general use for fire and heat, is a well-known protection for iron and other metals, as well as wood, is also made by this firm. Our readers interested in the "Ruberoid" roofing will obtain all information on applying to Robert W. Blackwell and Co., 59, City-road, or any of their branches at Manchester, Liverpool, Cardiff, Paris, and New York.

A memorial cross of granite, about 15ft. in height, to the late Lord and Lady Blackford, in the picturesque village of Cornwood, Devon, was unveiled by the Bishop of Exeter on Friday last. It has been erected from the design of Messrs. Hine and Odgers by Mr. Kerslake, of Cornwall.

Mr. Henry Lovatt, of Wolverhampton and London, has obtained the contract for building the extensive barracks decided some time ago to be erected on Salisbury Plain. The contract amounts to over £1,000,000, and the buildings are to contain quarters for eight battalions of infantry, including 22 double-company barracks, canteens, sergeants' mess, bandrooms, drill-sheds, guard-houses, and other buildings. The site is at Clarendon Hill. The village is to be built by the contractor to accommodate the large number of men required for the works, and a railway has been constructed by the War Department from Tidmarsh to Tidmarsh, where it is permanent. The work will be commenced almost immediately.

In referring to the retirement, owing to ill-health, of Mr. Glover, of Newcastle-on-Tyne, the *Newcastle Chronicle* says: "Although more especially identified with the Northern Architectural Association, Mr. William Glover has gathered around him a large circle of friends in Newcastle and district, whose kindly wishes he will carry with him to his new home at Widdow's. Mr. Glover will be remembered as the architect of the building in connection with the Royal Jubilee Exhibition of 1887; and as an indication of his interest in his retirement, presented a handsome badge to be worn by successive presidents of the Northern Architectural Association." A testimonial is to be presented to Mr. Glover by the members of the N.A.A., as a slight acknowledgment of his long continued kindly interest and frequently renewed

OBITUARY.

We regret to announce the death, at the age of sixty-two years, of Mr. CHARLES DOUGLAS INNOCENT, architect, of Sheffield. He passed away on Saturday last at his residence, 18, Wellesley-road, Sheffield, and was interred on Tuesday at Burngrave Cemetery, near that city. The deceased gentleman, who only last week announced his intention to retire into partnership with his son, Mr. Charles Frederick Innocent, A.R.B.A., who had been associated with him in business for several years, served his indentures with Messrs. Weightman, Hatfield and Goldie (now Hatfield, Son, and Garland, of Sheffield), and was for many years in partnership with the late Mr. Thomas and Sons, who had been a pupil under the same firm, and together the names were for long closely identified with the public schools. Their school buildings of the late 'sixties were regarded as a great advance on what had been previously done. Messrs. Innocent and Brown were the architects for the first Board School, building commenced in England under the Education Act of 1870, and the partners published in 1874 a work entitled "Illustrations of Public Elementary Schools," showing fifteen buildings erected from their designs in Sheffield and vicinity at expenditures varying from £3,000 to £11,000 each. Mr. Innocent was the inventor of various school appliances. He was a past-president of the Sheffield Society of Architects and Surveyors, and joined the Royal Institute of British Architects so far back as 1865 as an Associate, being a Fellow of that body in 1889, and served for some years on its council. He was also a Fellow of the Institution of Civil Engineers. Mr. Innocent was a warm supporter of the Sheffield Sunday School Union, and organised many great gatherings of school-children. He was of commanding physique, and was one of the first Volunteers in England. In 1869, in conjunction with Mr. C. E. Hatfield and Mr. Harry Hens, now of Exeter (all three that time prominent and promising students in the Sheffield School of Art), he was the founder of the Engineer Volunteer Corps of the City-road, by a long way the smartest battalion of that arm of the service in England.

At Douglas, Isle of Man, on Saturday, Mr. Samuel Harris, corner, held an inquiry concerning the death of Mr. A. L. Forrester, a well-known architect, who on Friday cut his throat in his office. Mr. Forrester, who went from Birmingham, and was well connected, was fifty years of age. He was not married, and lived over his office. He had been much depressed because of the slump in the building trade at the Isle of Man, and he had been under the doctor's care. He had a mistake in regard to certain building operations. A verdict of "Suicide while mentally deranged" was returned.

MR. EDWARD EMERSON OLIVER, M.I.C.E., who has died suddenly of heart-failure at Boscombe, in his 59th year, was until his retirement in 1899 one of the best-known engineers on the Indian establishment, and another of some repute. He joined the Public Works Department as an assistant engineer in 1868, and within six years reached the grade of executive engineer. In 1883 he became assistant secretary to the Punjab Government in the Public Works Department, and under-secretary a year later, rising, after a period of service as superintending engineer of the province, to chief engineer in April, 1897. He was transferred in a like capacity to the Central Provinces, where he had charge of the Public Works Department up to the time of his retirement nearly three years ago. He wrote not only on "Reh Swamp and Drainage" and "Coal and Iron in the Punjab," but also on historical, anthropological, and numismatic topics.

The death has occurred at Barcelona of Mr. R. A. W., a well-known estate agent, of South John-street, Liverpool, secretary to the Liverpool and Bootle Property Owners and Ratepayers' Association, and also to the National Property Owners' Association. It seems that Mr. Bellwood, who had been in indifferent health for some time, left Liverpool on a trip, agent, or business, intended to his wife that he trusted a change of air and scene would do him good. It was, therefore, a great shock to his relatives and friends to receive the intimation that a few days ago his body was found on the shore at Barcelona. Mr. Bellwood was born at West Derby in 1818, and commenced business as an estate agent, or agent, in 1838. For a period of eight years he was a member of the old West Derby Local Board, and he took much interest in public

affairs. In 1850 he was chosen as secretary to the Liverpool Land and House Owners' Association, in succession to the late Mr. John Murphy. Subsequently that association extended its scope of work, and assumed the title of the Liverpool and Bootle Property Owners and Ratepayers' Association, and as its secretary and adviser Mr. Bellwood advocated many changes in the mode of levying rates and the incidence of taxation, being frequently a member of important deputations to Government departments in London. Officially he attended the periodical conferences of similar associations in various parts of the country, as well as those held by the National Property Owners' Association. For a considerable period he was a member of the West Derby Waste Land Commissioners. The deceased leaves a widow and family.

CHIPS.

A special general meeting of the members of the Builders' Clerks' Benevolent Institution was held at New Bridge-street on Tuesday week. Mrs. Sarah Gough was elected to a full year's office—viz., of secretary. Mr. William Seymour was also elected to the builder's clerks' pension of £30 per annum.

A special meeting of the shareholders in the Tanat Valley Light Railway Company was held at Llewellyn last week, when the engineer, Mr. A. J. Collin, reported that good progress was being made with the construction of the railway. About four miles of fencing was practically completed, a junction with the Nantmawr branch had been made at Llanyblodwel, and the plans for the bridge over the river Tanat fixed ready for the girders to be put in position. The work was being carried on at some six or seven different points between Llanyblodwel and Llangedwyn, and it was hoped that, that section up to Llangedwyn would be completed very shortly.

The Private or Local Bills for the ensuing Session number in all 318, consisting of 45 railways, 24 tramways, 72 miscellaneous, and 174 provisional orders, including electric lighting. This total compares unfavourably with that of last year, when it was 362, made up of 4 railways, 24 tramways, 6 miscellaneous, and 190 provisional orders. The miscellaneous schemes include Dover Harbour, Liverpool Post Office (Acquisition of Sites), Dartford Improvement, Medway and Thames Canal, Royal College of Science and Public Offices Site, L.C.C. (Tramways and Improvement), and South Ham Improvement. The English Bills for next session also show a marked decrease, being only 318, as compared with 363 last session and 418 for the previous year.

The Empire Hotel, in the Orange Grove, Bath, was opened on Friday. It has been built for Messrs. Spiers and Ponds at a cost of £50,000, and is six stories in height, with two stories of attics and an octagonal clock-tower at the principal angle, that to the south-east. The style is Renaissance, and the building contains over 120 beds and sitting-rooms. The painting and decorations have been carried out by Messrs. Smee and Cobay, of New Bond-street, W. The architect is Major C. Davis, F.S.A., of Bath.

In addition to the stained-glass window that is to be placed in the Hexham Abbey in memory of the late Captain Dyer, of the 1st Life Guards, John Nicholson memorial commemorative of a late organist and choirmaster.

An action is being brought at the instance of the Mersey and Irwell Joint Committee against the Salford Corporation for the alleged pollution of the Manchester Ship Canal.

At a meeting of the Lochaber District Committee, held at Fort William on Friday, Mr. C. M. Intosh, borough surveyor, Dunoon, was appointed road surveyor and district sanitary inspector for the Lochaber district, at a salary of £240 per annum.

The water committee of the corporation of Liverpool recommended the council to employ the acceptance by the committee of a tender of Messrs. Holme and Knig to carry out the works requisite to establish communication between Wyrnwy Aqueduct at Delamere and a receiving depot at Wallacey, so that the latter district may have the advantage of a continuous and pure supply of water. The amount sanctioned by the Local Government Board is £146,000, but it is believed that the cost of the operations will be less than this.

Mr. William Chatham, M.I.C.E., late of Bristol, has been appointed Director of Public Works, Hong Kong, by the Secretary of State for the Colonies. The position carries with it a seat at the executive and legislative councils. Mr. Chatham was for some years a member of the British Consular Service, and left to fill an appointment in Hong Kong as senior executive engineer in the Public Works Department.

Building Intelligence.

BAILEYS.—The Brecon Schools, built in 1855 to accommodate 150 children, have been enlarged so as to house an additional 240 scholars. The enlarged buildings were opened by Sir John T. Drummer, on Tuesday week. Mr. A. F. Edwards has been the architect, and the work of construction has been carried out by Messrs. Huskell and Co. The new portion of the building, which harmonises with the old, consists of two wings containing four classrooms and two cloakrooms. The largest classroom is 25ft. by 45ft., and the smallest 20ft. by 24ft. One of the rooms is fitted up for cookery instruction, a gas-cooking range, patent tubs, and a gallery for the students being features of the room. The desks each accommodate two scholars. The building is in the Jacobean style, and is built of Russian brick with terra-cotta dressings, and green slate roof. The new portion of the work has cost some £3,500, the outlay on the complete school has been £10,000.

BATHING, N.B. The new fever hospital which has been erected at Tiptonhill, near Bathgate, was formally opened on Saturday afternoon. The building and furnishing have cost over £8,500. The new hospital gives accommodation for twenty-eight beds: two pavilions containing twelve beds each, and two observation wards, which are attached to an administrative block, accommodating two beds each. The cost per bed works out at £316. Messrs. John Melvin and Sons, Alloa, are the architects.

CHILWYBAY, N.B. This watering-place has progressed so rapidly that the large post-office premises in Station-road have long since proved inadequate for their purpose, and the postal authorities have, therefore, decided to erect a more spacious building in Penrhyn-road, opposite the entrance to the proposed new railway station. The new building has been designed by Messrs. Booth, Oldwick, and Porter, the cost being estimated at £1,000, and the plans have been approved by the Postmaster-General and the Treasury. On the ground floor will be a large public office, a waiting room, a cloak-room, a ladies' room, and sitting rooms; the first floor will contain the postmaster's office, and the second floor the telephone and telegraph instrument rooms. It is a four-story building, and will consist in the main of buff bricks and terra-cotta dressings. Building operations have been begun this week, the contract having been intrusted to our illor John Roberts.

LIVERPOOL STREET, E.C. For the last two years the Great Eastern Railway Company's Liverpool Street Hotel has been undergoing extensive alteration and re-decoration, and during the last six weeks the directors have entirely closed the building. The hotel was reopened on Monday. Little alteration has been made to the exterior, except to the Liverpool Street frontage, where the space formerly occupied by a number of shops has been utilised, and a sitting-room built upon it. The interior of the building has been entirely remodelled. The scheme of decoration is simple. The entrance-hall has columns, pilasters, and panelled ceiling. On the same floor is the dining-room, which is nearly twice the size of the former room, and has large red Scagliola columns supporting the ceiling, and the most beautiful of the dining-room, new smoking and billiard-rooms have been constructed, as well as a hair-dressing-room. The bedrooms number upwards of 300, bed-sides new suites of self-contained apartments. In the construction of the hall, which is temporarily occupied by the Baltic Company, the architect has followed one of the best examples of French work in Louis XV. series—an apartment in the Palais National in Paris. The mantelpieces and the paintings over the doors, after Boucher and Trémouilles, are copies from the originals of the Palais National. At one end a gallery is fitted for orchestral purposes. On the walls of the grill-room, which has been reserved, are the decorative paintings of old London Bridge and Westminster Bridge, and of historical personages connected with the City. The buffet is late Elizabethan in style. On one side of the buffet is a painting of old Bishopsgate in 1624, with Sir Paul Pindar's house, which once stood on the present site of the Great Eastern Company's station. A Masonic temple, Egyptian in character, is provided. The whole of the establishment has been utilised as a

head depot and distributing centre, while the kitchen is situated at the top of the building. The additional buildings, decorations, and furnishings have been carried out by Messrs. Maple and Co., Col. R. W. Edis, F.S.A., was the architect.

PENTONVILLE, N. Lady Jeune on Saturday afternoon laid the foundation-stone of the new mission hall of All Saints, Pentonville, N. The site, which is estimated to be worth £2,000, has been presented by Captain Penton, the freeholder, who has also contributed £1,000 towards the building. The dimensions of the church are only 35ft. by 45ft., but seating accommodation will be provided for 250 persons. Below the church is a gymnasium with the same floor space and 4-ft. high. The building has been designed by Mr. R. A. Briggs, F.R.I.B.A., and is being constructed by Messrs. Campbell, Smith, and Sons in red brick with Bath stone dressings. Its cost will be £1,500.

WEST MALING, N. On Wednesday week the Archbishop of Canterbury dedicated the restored and enlarged parish church of St. Mary's, West Malting, N. The alterations have been very comprehensive. The whole of the nave, with the exception of a portion of the east and north walls, has been rebuilt, with the north and south aisles, and in the reconstruction an extra width of some 15ft. has been provided. Practically the whole of the fabric of the earlier church in the Italian style, built about a hundred years ago, has been replaced, while Norman work there was being retained in the chancel and lower. The work, which has entailed an expenditure of over £5,000, has been carried out by Messrs. Wallis and Son, of Maidstone, from the designs of Mr. J. T. Micklethwaite, F.S.A., of Westminster. The rebuilding of the organ was intrusted to Mr. Walsley, of Maidstone.

YATTON, N. The tower of Yatton Church, one of the landmarks of Somerset, was rededicated by the Lord Bishop of Bath and Wells on Saturday. The church itself is a remarkably fine building, and a peculiar feature of it has always been, so far as can be traced, its stunted tower. Some time ago the tower and some of the parapets were found to be in an unsafe state, and parishioners became at once keenly divided on the question of repair or rebuilding, those in favour of the former doing all in their power to secure the continuance of the tower, while the latter were held, and expert advice taken, the Society of Antiquaries reporting that the tower could be repaired and made as efficient as if rebuilt. Mr. Edmund Buckle, diocesan architect, on the other hand, reported strongly in favour of rebuilding, and this latter course was at length adopted, and the work has been carried out by Messrs. Merrick and Son, of Gloucester, who have preserved much of the original stone as possible, and the tower again stands out in its stunted form.

On Saturday the new United Free Church at Newtyle, N.B., which has been erected at a cost, exclusive of bell and organ, of £1,600, was formally opened.

The Granger-arch, Newcastle-on-Tyne, after being removed and repaired, is opened on Friday. The length is about 317ft. by 55ft., exclusive of the side shops, and this area of floor space has been fitted with kiosk-like stalls, varying in size. The outlay has been £10,000, including the re-roofing on iron trellis ribs and girders.

Choir-stalls of Devonshire oak have just been placed in the parish church of St. Philip at Sydenham, S.E., in memory of the late Mr. Adams. They are of 14th-century character, and have been carried out by Messrs. Harry Hems and Sons, of Exeter, from designs by Mr. W. Hilton Nash, F.R.I.B.A., of Cannon-street, E.C.

At the last meeting of the Middlesex County Council, the light railways committee brought up a report stating that they had come to a bargain with the London United Tramways Company with reference to the construction of tramways in the western part of the county. This agreement restricted the company from promoting lines outside the boundaries of the county and the council from taking any interest in any tramway scheme in the remainder of the county. After a long discussion the recommendation was agreed to.

The Committee of the International Exhibition of 1904, at London, which is to be held in Tunis, have received plans of the British section designed by Mr. Walter Crane. The British collection will include works lent by Mr. Walter Crane, the Arts and Crafts Society of London, and specimens of work from various art schools.

PROFESSIONAL AND TRADE SOCIETIES.

ENGLISH ARCHITECTURAL ASSOCIATION.—A meeting of this association was held on Wednesday, the 27th inst., in the rooms, No. 117, Abchurch-lane, E.C. 4, when Mr. Henry E. Kerr, president, in the chair, Mr. Louisa C. Barnes, B.A., delivered a lecture on "The Old Monuments of Provence." The lecture opened with some remarks on the history of the country, and showed how the influence of Greek and Roman civilisation began earlier and finished later than in the rest of the Gaul, and therefore left a stronger mark on the people, who have thus preserved an individuality, and have been, so to speak, a nation apart from the rest of the French. Some of the monuments, Roman theatres, amphitheatres, temples, mausoleums, &c., in the following towns were specially mentioned—Orange, Avignon, Tarascon, and Beaucaire, Arles, Arles, Mortis, Caracaus, and Nîmes. These buildings were also illustrated with a set of limelight views. At the conclusion of the lecture, Mr. Hunter Crawford proposed a vote of thanks to Mr. Barnier for his lecture, which was duly accepted.

SLATE TRADE CONFERENCE AT SARGBOROUGH.—At the Pavilion Hotel, Scarborough, the ninth annual conference of the National Association of Slate Merchants and Slators was held on Thursday last week. Mr. Jonathan Davis, of Portsmouth, the president presiding. There was a large attendance of members from different parts of the country. The president, in the course of his presidential address, said that the past year had not been a futile one. The association had in several directions taken a practical step forward. The quarries were favourable to the association, and the association was only too ready to do no distant date probable. The president alluded to the formation of a presidents' section of the association, and declared that if roof slating were to hold its own in the future, the work must not only be well done, but be more artistically done. In this kingdom the slating of roofs was far behind what it was on the Continent. There were several districts signs of decline in the building trade, but he appealed strongly to members to remain loyal to the local branches as well as to the association. Mr. James Twynsley, Hull, the hon. general secretary, in the course of his annual report, stated that during the year a scheme for the confederation of national associations of the building trades had been extended, the result being the affiliation of the plumbers', plasterers', and slate merchants' associations. The association had not had occasion to draw upon its reserve funds, even during the Hull strike. Mr. J. Hunter, Hull, presented the annual balance sheet, which showed that the association was in a sound financial position. The report and the address were adopted. It was resolved to hold the next half-yearly conference at Lancaster. Mr. James Twynsley, Hull, read a paper on "The Lessons of the Hull Strike."

SUNDERLAND AND DISTRICT BUILDING TRADES ASSOCIATION.—The annual meeting of this body was held on Friday night in the Grand Hotel, Sunderland. In the annual report, which was read by Mr. W. H. Hope, the secretary, it was stated that there was one great question looming on the builder's horizon, as it did on the horizon of employers generally, and that was the great evil which was threatening the entire business relations of employers and employed. This referred to the action of the operatives in the way they worked in the different branches of the trade. The effect of the limitation of the amount of work to be done by a workman kept up the cost and militated against the letting of contracts, and, further, was handicapping this country enormously in its struggle to maintain its commercial supremacy. Mr. J. B. Stott was elected president, in the place of Mr. J. W. White, who retired.

The Manchester Art Museum and the Manchester University Settlement have been amalgamated into one institution. The close connection of the work of the two bodies has made the step necessary and convenient.

At Downfield, Dundee, the foundation-stone was laid, on Saturday, of the Episcopal Church of St. Luke. The church will be Gothic in style, will seat 250 persons, and will consist of nave, chancel, and vestry, with provision for a tower and spire to be subsequently added.

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ILLUSTRATIONS.

SUBJECT OF ST. AUSTIN, GOLDENCLARE.—WHITNEY COURT, HEREFORDSHIRE.—QUEEN VICTORIA MEMORIAL DESIGNS.—PUGIN STUDENTSHIP SILVER MEDAL DRAWINGS.—COUNTY COUNCIL OF OLDHAM PUBLIC BUILDINGS.—NEW BRANCH LIBRARY, HOLBECK, LEEDS.—NEW SCHOOL, CRAIGELLACHIE.

Our Illustrations.

CHURCH OF ST. STEPHEN, GOLDENCLARE.

This design was placed first by Mr. Macvicar Anderson in the recent competition for the new church. The building is to be erected in Goldenclare, a hamlet, and will stand east and west along the Ferry-road. Accommodation is provided for 800 worshippers in the area, and it is intended to have, some time in the future, a gallery at the west end to seat 200 more. The church is to be built of red stone, and the roofs slated with North of England green slates, and the spire covered with chestnut copper. The cost of the whole church will be about £10,000. The architect is Mr. George Watson, of Edinburgh.

WHITNEY COURT, HEREFORDSHIRE.

This house, which has been recently erected for Mr. James L. A. Hope, is situated high up on the northern slopes of the Wye Valley, midway between Hereford and Brecon. Considerations of "prospect" entered largely into the design, beautiful views far across the valley being obtained from all the principal rooms, which for this reason were ranged along the south front. The walls are of a hard, warm-coloured limestone from a quarry on the estate, with dressings of Bath stone; the roof is tiled with plain red Broseley tiles, the chimneys being of red brick. The architect is Mr. Thomas Henry Watson, of London. The general contractors were Messrs. James and Goffrey, of Tisbury. The Citter Manufacturing Co., of Braintree, Essex, supplied the gunmetal casements. The drawing from which our illustration is taken appeared in this year's exhibition of the Royal Academy.

QUEEN VICTORIA MEMORIAL, ST. JAMES'S PARK, S.W.

This gateway here illustrated shows the Renaissance architecture adopted by Dr. Rowand Anderson for his entrance from Spring Gardens into the new processional road to be formed in the Mall. We illustrated the bird's-eye view of this scheme in the BUILDING NEWS for Nov. 15. The second plate given to-day in illustration of this project illustrates the internal arrangement of the Grand Place in front of Buckingham Palace as designed by Mr. T. G. Jackson, R.A., whose general perspective view appeared in our pages for Nov. 8 last.

PUGIN STUDENTSHIP, R.I.B.A. SILVER MEDAL DRAWINGS.

We reproduce this week another of the sheets of drawings, by Mr. J. Forbes Smith, which gained the Silver Medal in the Pugin Studentship Competition. The sheet contains a few interesting details collected during a summer tour among the churches in Norfolk, &c.

ROBIN HILL BATHS, OLDHAM.

These premises are erected at the corner of Dunsbar and Trafalgar streets, fronting the former, being set back from the street line, and having a boundary wall, with ornamental gates and railing in front. A separate entrance is arranged for the sex from Dunsbar-street, with ticket-office below, and near the respective entrances are two waiting-rooms, one for each sex. The swimming bath is 9 ft. by 4 ft. 6 in., with swimming pond 15 ft. by 27 ft., the depth being 6 ft. 6 in. at one end, 5 ft. 6 in. at the other, the bath being arranged round three sides 57 dressing-boxes, the divisions to same being of polished marble. There are two wash-baths, also showers provided. The sides of pond are faced with white glazed bricks up to water-line. From this point to end of coping is an effective treatment of tiling in pale green and cream tiles, the bottom of pond being tiled with white tiles, relieved with bands of black. A balcony is carried round the four sides of the hall, with gentlemen's private baths arranged down two sides, one side containing 13 first-class baths including the vapour bath, and the other side 2 second-class baths. The ladies' private baths are on the first floor, over waiting-rooms, &c., there being four first class including one vapour bath and seven second class; also attendant's store-room. All first-class baths are provided with showers. The supply of hot and cold water to private baths is regulated by means of valves under the control of the attendant in corridors. A laundry superintendent's house, mechanics' shop, store-rooms, and spacious cellars are also provided. The whole of the work has been carried out from the designs, and under the superintendence of, Mr. Charles T. Taylor, A.R.I.B.A., architect, 10, Clegg-street, Oldham.

NEW BRANCH FREE LIBRARY, NINETEEN ROAD, HOLBECK, LEEDS.

The entrance is situate at the top corner of the site at the junction of the four streets, and by means of steps gives approach to the main door, which is 6 ft. 6 in. above the level of the pavement at this point. A vestibule is provided leading to the reading-room, lending library, and ladies' room. The reading-room is a well-lighted, lofty room containing a floor area of 2,000 sq. ft., with a height of 20 ft. 6 in. to the crown of the ceiling. The newspaper stands are ranged along the walls, and by means of a staircase, so as not to interfere with readers at the tables. The lending library contains accommodation for 15,000 volumes on the ground floor; but, in view of the extension of this department, a gallery is provided which allows for a future additional accommodation of 12,000 volumes. Bookcases are provided in the borrowers' lobby for the exhibition of the more recent additions to the library. The attendants have complete supervision of the three rooms and entrance vestibule, with facilities for the quick service of books to each room. The librarian's room adjoins the attendant's, and communicates direct with the large reading-room, and there is a ladies' room, a store-room, assistants' dining-room, &c., lavatory, heating chamber, and coal store are provided in the mezzanine floor. A separate entrance from the street is provided for the boys' room; the floor of this room is 6 ft. 6 in. below the level of the entrance, and the lowest portion of the site; an attendant's lobby adjoins with bookcases, and communicates with the attendants on the upper floor by the service staircase. The whole of the rooms will be effectively ventilated by means of vitiated-air trunks communicating with the street driven by a steam motor placed in the turret provided for this purpose. Special upshots are carried up from the boys' room. Fresh warmed air is to be admitted from the outer walls, and passed through the hot-water radiators. The whole of the rooms to be heated by hot water at low pressure. The external walls to be finished with red stone dressing. The entrance with its vestibule to be tiled with faience. The floors of the public rooms to be laid with wood-laid flooring. The cost of the building is about £3,600. Mr. William Bakewell, F.R.I.B.A., is the architect.

NEW SCHOOL AT CRAIGELLACHIE.

The school board of Aberlour are providing a new school. The central school in Aberlour is a new building finished in 1897 at a cost of about £1,000, and this new school at Craigellachie just opened provides for the growing requirements of that and the parish. The school provides accommodation for about 130 pupils in two large

and well-lighted classrooms fitted up with the latest desks and other appliances, and divided into a wood and glass screen, which can be wholly removed to the side walls. At both ends there are porches, with ranges of wash-hand basins in each, and ample provision for caps and cloaks. There is a teachers' room of convenient size, with lecture hall attached. The playgrounds have in a measure a covered playshed, and the usual conveniences. The exterior of the building is in character with its situation in Craigellachie. The walls are built of native stone, with freestone dressings, from Newton Quarries, and the roofs are covered with green slates and red tile ridges. Messrs. Brown and Watts are the architects.

A HISTORY OF AIR HITTING.

See review and further illustrations on p. 751.

CHIPS.

A lecture was given on Tuesday at the Liskard Literary Institute of the Towers of Cornwall, by Mr. Edmund Sedding, F.R.I.B.A., of Plymouth. The characteristics of local churches were succinctly described, and were illustrated by lantern slides.

A French return on tramways and street railroads shows that in that country electric traction is fast superseding the out-of-date horse traction. Of 1,233 kilometres of purely passenger tramways, 495 are worked on the overhead electric system, 130 kilos partly with horses and partly electricity, and four kilos with electric apparatus, while on 242 kilos, principally in Paris and its environs, the motive power is obtained from vapour engines and compressed air, and on only 133 kilos, or less than 10 per cent. of the whole, horses are still used.

Messrs. E. H. Shorland and Brother, of Manchester, have set on foot their plan of erecting graters to the Receiving House for Children and Nurses' Home, St. Giles' Workhouse, London.

There has just been placed in St. John's Church, Riverhead, a stained-glass window to the memory of Miss Clara Evans, an army nursing sister, who died from enteric at the hospital, South Africa, in May of last year. The window, designed by Messrs. Powell and Son, of Whitefriars, London, has three lights. One represents a South African battlefield, with bloodstains on the ground, and the other two a representation of Sister Evans in army nursing costume; and the remaining alight displays the work of a nursing sister in a London hospital. At the foot is an inscription.

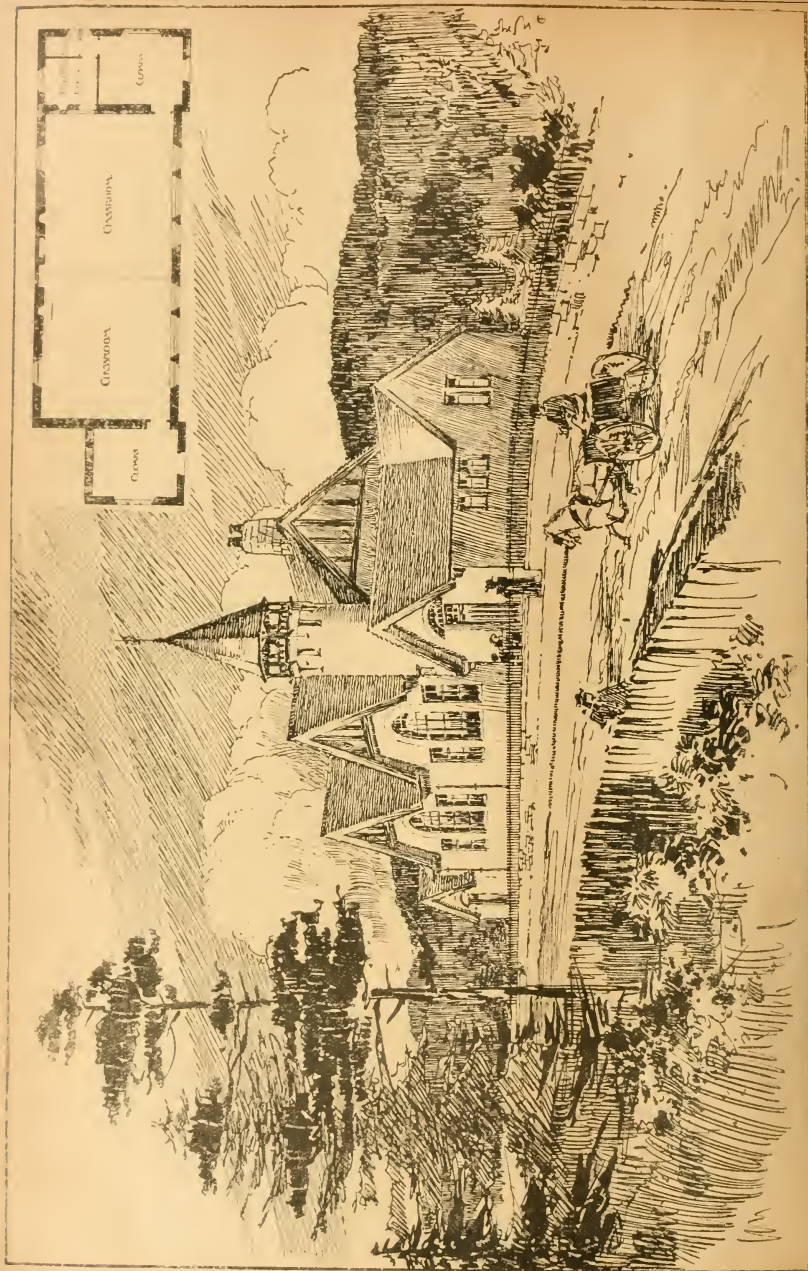
The foundation-stone of an extension of the Kendry infirmary of an extension of the Kendry infirmary was laid on Friday. It is proposed to add a new wing, at a cost of £7,521, from plans by Mr. J. H. Taylor, borough surveyor, and this, with other extra work, will bring the total charge to be borne up to £21,051. The new wing will provide for 25 additional beds, making 70 beds altogether.

The chairman of the Whitworth Urban District Council formally opened on Wednesday week the new bridge which has been erected over the river Spalden at Halifax. The bridge has been built on steel girders, 14 in. by 8 in., the spans between being filled with 12 in. of concrete. The crown of the road over the bridge has been lowered 18 in., and the lower portion has been raised 15 in., so that the gradient has been materially reduced. Whereas the average width of the old bridge was 13 ft. 6 in., the new bridge is nearly double that width. It has been constructed in plain by Mr. T. Baker, surveyor to the council.

The permanent collection of the Corporation Art Gallery, at a cost of about £2,500, of the following half-dozen pictures:—Oil-painting by W. L. Wyllie, A.R.A., "The Passing of a Great Queen"; oil-painting by Herbert J. Draper, "Telemachus and Penelope"; oil-painting by Mrs. De Morgan, "Life and Thought Have Gone Away"; oil-painting by F. A. Deloche, "Haymakers Resting"; water-colour by J. Clinton Jones, R.C.A., "The Sea View"; water-colour by J. Kirkpatrick, "Sultry June."

The Bishop of St. Asaph will dedicate on Tuesday next, the 10th inst., a new organ which has been given to Hawarden Church by Mr. Henry Glaston. On the same occasion the Bishop will dedicate a church with memorial cross, on which are engraved the names of six Hawarden Volunteers who died in the war in South Africa.

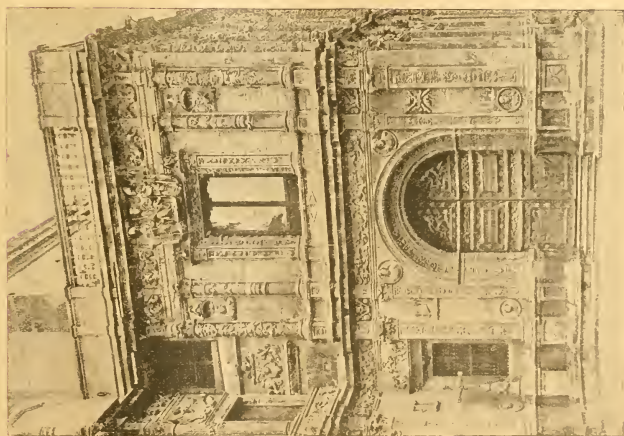
The Birmingham water scheme promises to be a costly venture. Already the returns in the possession of the Water Committee of the Corporation show that a work which was estimated to cost three and a half millions sterling will involve an expenditure of five millions. The sum authorised by Parliament for the completion of the scheme was £5,000,000, and it is probable that the work will be far exceeded before the project has been completely carried out.



NEW SCHOOL, CRAIGELLACHIE, ABERDEEN. N.B.—Messrs. BROWN AND WAIT, Architects.



PATIO, HOUSE OF MIRANDA, BRUGES.



TOWN HALL, SEVILLE.

A HISTORY OF ARCHITECTURE.—SEE PAGES 754-5.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents, and all communications should be drawn up as fully as possible, as there are many instances when they are allotted to correspondents.

It is particularly requested that all drawings and all communications respecting illustrations or literary material should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn, Palace Strand, W.C., and not to the office of the paper. Correspondence is not unfrequently otherwise sent. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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REVENUE.—G. M. G.—J. W.—E. F.—M. R. and C.—F. R. D.—L. C. D.—W. E. K.—D. M.

BORNEO.—The inevitable practice is to measure the girth or to take an average, not to measure the actual line of the minding.

BUILDING NEWS' DESIGNING CLUB.

J. N. KAYE.—The site is exclusive of the schools, and the church is to stand within its own site. Do not design the schools.

PRICE.—Read the notices published last week.

Correspondence.

COMMUNION TABLES IN CHURCHES.

TO THE EDITOR OF THE BUILDING NEWS.

SIR, Two copies of this interesting question have been brought forward by your correspondents, and the central position of the Holy Table 1. prefer the word "altar," for the reason named by Mr. Harry Hens, and naming none in accordance with ancient and modern usage, and the position of the general eastern position in the nave. Mr. Hens' reply is very satisfactory, but the new Low Church Cathedral is a good opportunity for making the experiment. On the other hand, we have to consider the English medieval custom, more or less, of placing the altar, and altar rails, some 100 yds. from the congregation, and the altar rails, but such facts with some ground of authority, as rather a hindrance to the "modern" position, from which it is difficult to disengage it in the minds of Churchmen. The works of Messrs. William H. James and

Thomas W. Watkins point to the inconvenience of the central position, while Mr. Lovegrove points to the advantage of such a position in large churches, the avoidance of the "long walk from the nave to the altar-rails." It seems to me there are advantages and disadvantages in the central and advanced position of the altar. The advantages are: 1. it would economise the area of our large churches, by placing the congregation in a more compact arrangement; 2. it would give a motive for a more dignified architectural crossing; 3. it would make the altar the prominent feature. On the other hand, the disadvantages are: (a) it would not be so economical in planning of churches of ordinary size; (b) it would not favour the eastward position, as it would require the congregation to face in opposite directions. The question is a difficult one, both on ritual and architectural grounds. Confining attention to the architectural grounds, it should be pointed out the central position would demand a more dignified altar, for we can imagine what the old "communion table" of the early 19th-century churches would be placed in the crossing of a large church or cathedral. The central position would also involve a ciborium or baldachin over the altar, as it might be seen from all parts of the church.

In the basilica, the altar stood out from the eastern end. Behind it was the presbytery or sanctuary, where the priests stood during Divine service, with the bishop's chair in front.

Before the altar was a balustrade of rails called the *ambo*, which formed the choir. The altar itself was made the prominent feature in this arrangement. There was no reredos or screen attached to it; but over the altar was the ciborium or baldachin, as we see it in St. Peter's, at Rome. In the Pre-Reformation Church of England the ciborium altar was not used, but hangings or curtains behind the altar, which was then generally placed against the eastern wall of chancel. These arrangements represent the two positions discussed—one used in basilican, and the other adopted for domical cross churches; it must be remembered that our modern church plan is based upon the ancient basilican. In Italy the ciborium altar is often found in the eastern end, as we see it at St. Sulpice in Paris; while in this country, as we have said, the altar was generally placed against the east end of chancel. On the whole, I consider the central position, one that would favour an architectural and dignified arrangement, but unsuited for the ordinary modern parish and mission church. In cathedral churches like St. Paul's, the central or crossing position for the altar would be advantageous for the reasons expressed above, and as "A. T. L." observes, the junction of choir and nave at St. Paul's was proposed for it by the late Mr. Street; but this position would quite destroy the unity of a church of ordinary dimensions.—I am, &c., ANGLICAN.

INSANITARY ANGLES.

SIR, In this age of the Universal Provider, "Inquire within upon everything" may soon have to be announced over the entrance to our Police-courts. It speaks volumes for the character of our magistrates and the patience of our people that honesty of purpose has so long been accepted when it is patent to all concerned that the instrument of Justice is so often wanting in the technical knowledge without which an opinion is as likely to be wrong as right.

When a sanitary inspector of a local authority differs from a qualified and experienced architect or engineer as to the inclination at which a drain should be laid, the Legislature in its wisdom has imposed upon our magistrates the duty of deciding between them, and thus it came about on Friday last that Mr. Curtis Bennett, at the Marylebone Police-court, decided that a new stone was drain, built in concrete, proved to be sound and water-tight and thoroughly well constructed, should be taken out and replaced with a new one. I have shared the opinion of the sanitary inspector that a pipe at an angle of 90° with the horizontal did not give a suitable fall.

Is this the discovery of an insanitary angle? Or, as it is a gross interference with reasonable liberty? Because I contended a drain with a vertical fall rather than endanger the foundations of the house by putting the drain several feet from the ground, and my opponent contended such a drain is, therefore, dangerous to health? If this cannot be maintained, has not the inter-

ference of the sanitary inspector reached a stage when some serious stand should be made against it? I am, Sir, MARK H. JENKS, A.R.C.S.D., Fellow Sanitary Institute, Association of Medical Officers of Health, 7, Pall Mall, Dec. 3.

NEGLECTED SOUTHWARK BRIDGE.

SIR,—It seems useless to offer alternatives to any scheme that official bodies have set their minds upon, and now they are determined to destroy the beauty of London Bridge, no reasons, however cogent, for abandoning the project will probably meet with any consideration.

It is already well known that, partly through the opening of the Tower Bridge, partly on account of the Tube and other railways, the traffic over London Bridge is no greater now than it was five years ago, and there is no ground for supposing that matters will be greatly different in the future.

What I want to point out is, that if some effort were made to divert to the adjoining Southwark Bridge—now almost deserted—some of the traffic passing over the older route, the congestion sometimes occurring might be still further reduced.

Some years ago there was a line of trams from near the Elephant to Southwark Bridge, although few knew of its existence. If this were resurrected, the fare reduced to a 3d., and a line of "buses" started from the Elephant to Southwark Bridge, to say the Guildhall, much would be done towards popularising this convenient route, and relieving London Bridge.

The cars, however, should start from the Elephant, or, better still, new services should be appointed of through cars from Brixton, Clapham, and Camberwell, alternating with those to the other bridges.—I am, &c.,

EVANSTON A. PULFORD.

Authors' & Booksellers' Co-op. Publishing Alliance, Ltd., 151, Strand, W.C.

CHIPS.

The partnership heretofore subsisting between J. S. Pearce and W. C. Parnell, architects, Bourne-mouth, under the style of Pearce and Parnell, has been dissolved.

A stained-glass window representing the Crucifixion has been placed in the parish church of Melton Mowbray as a memorial of the late Captain Gordon-Wood. The window has been executed by Mr. C. E. Kempe, of London.

The Governors of the General Hospital, Tulsebury Wells, have adopted, after much discussion, a scheme for rebuilding and adding to the building prepared by Mr. H. Percy Adams, of London. The estimated outlay is about £20,000.

A new Y.M.C.A. building is in progress in Chowringhee road near the Indian Museum in Calcutta, and is advancing rapidly under the superintendence of Messrs. Mackintosh Burn and Co., of that city. It is expected to be ready for occupation in another six months.

An arcade is about to be erected in Wolverhampton, the line of the buildings being from Dudley-street, through John-street, to Victoria-street. The work of demolition of brick premises has now been completed, and the greater portion of the arcade will be completed in about six months' time. One of the features of the proposed buildings will be a block of premises to be utilised as a social club, with lecture-room, classroom, reading-room, smoking-room, billiard-room, skittle-alley, rifle-range, and dining-room.

The Caledonian Railway Company have decided to have Monroffie Tunnel, which is situated a short distance south of Perth, relined with brick. They have accepted contracts for the work, and at present the contractors are busy erecting work-shops for their men and material at the north end of the tunnel. While the work is being carried on, the railway traffic through the tunnel will be run on one set of lines. The company's engineers do not consider the condition of the tunnel in any danger. The object of having the tunnel relined is merely to strengthen it and prevent the possibility of anything occurring to endanger trains. The electric light will be introduced into the tunnel to expedite the work. Trains will be provided by a large area of land to the accommodation of the men engaged in the work.

Colonel Lund, Local Government Board inspector, held an inquiry at the town-hall, St. Helens, Lancs, the other day, respecting an application by the corporation for a provisional order under the Public Health Act to remove the Acts in regard to the acquisition of fire and buildings in Pocket's Nook for proposed new gasworks.

WATER SUPPLY AND SANITARY MATTERS.

Hawkesley and Moleston Water Board and **The Naden**. Mr. Diggle, C.E., have completed the higher scheme in the Naden valley. The old embankment has been strengthened and repaired, but the Naden tunnel has been added and the water supply of the reservoir increased from 1,000,000 to 1,500,000 gallons. In all respects the reservoir presents the appearance of a new reservoir, and the walls of the new works have been carried out to a depth of about 100 ft. by workmen employed directly by the water board, under the direction of Mr. Diggle and his staff of assistants. The Naden high reservoir has been a constant source of anxiety ever since it was constructed in the year 1860, the high water company, on account of the sliding tendency of a portion of the embankment, and during the past 30 years numerous experts including the late Thomas Hawksley, C.E., and Sir P. Freeman, C.E., were called in to advise the water company as to the means to be adopted to arrest movement. The embankment has now been strengthened by the addition of a large quantity of material and also the construction of a concrete retaining wall on the outer portion of the embankment. This concrete wall is 20 ft. thick, extends entirely across the Naden Valley (a distance of 600 ft.), having been carried to a shale foundation throughout its entire length. The works have been in progress during the last year. This is the first reservoir in the Naden valley which has been enlarged under the direction of Mr. Diggle, C.E., the capacity of the middle reservoir having previously been increased under his direction from 150 to 200 gallons. The new work is situated on a Clay-lane with a capacity of 75 million gallons.

CHIPS.

Mr. Chas. M. Carter, of Alton, Sussex, has been appointed highway surveyor to the rural district council of Eastbourne.

The **London County Council** received, on Tuesday, through consideration was by standing orders proposed for a week, tenders for the electrification of almost all the rest of its southern tramway system. The work has already been contracted for on part of the lines, and it is now proposed to supply the underground conduit electric system to several routes at a total cost of £641,350.

The new parish-hall of St. Simon's, Plymouth, has been opened by the Bishop of Exeter, and will be used for church purposes while the new church, to cost about £17,000, is being built. The hall has accommodation for about 500. Mr. Ambrose Andrews, of Plymouth, is the builder, the architect being Mr. Harbottle, Exeter.

The members of the Liverpool Architectural Society met at the Law Library, Castle-street, on Monday evening. Mr. C. E. Bateman delivered an address on "Castle Bromwich Church." He dealt mainly with the construction of the church and its chief architectural features, remarks being illustrated by lantern slides and plans.

The Liverpool Cathedral subscription list now shows a total of £151,418, and of this amount £451,000 has been paid into the bank at a meeting of the executive committee. On Monday, the Parliamentary plans of the site by St. James's Mount, submitted and approved, and a measure will be brought into the House of Commons next session dealing with these.

Cornel Von Dunsen, one of the Board of Trade inspectors, inspected at Manchester, on Tuesday, the Electric Bridge and the Electric Traction, and the High-street routes of trams, which have been converted from horse to electric traction. The routes were opened to the public on Wednesday. The High-road and Stockport-road routes will be opened for electric traction at the end of next May, the southern routes at the end of next November, and the Oldham road, Ashton Old-road, and Ashton New-road routes in March, 1903.

A marble tablet has been set up in Christ Church, Vienna, in honour of the Duke of Victoria. The tablet shows a life-size bust in relief of the late Queen, with wreaths on either side and emblems of England, Scotland, and Ireland.

On Thursday some thousands of people witnessed the racing of one of Brunner, Mond, and Co.'s large drais, the "Lancashire Express," just before the work. The underpinning was fired by Sir John and Lady Brunner, and the operations were successful and carried through. The chimney is one of three which Mr. Brunner has been commissioned to build for the company, their respective heights being 180 ft., 180 ft., and 190 ft. The stack just raised was the tallest, and its circumference was about 70 ft. Its estimated weight was 2,500 tons.

Our Office Table.

A Philosophical Examination, qualifying for the **Prize of the Royal Institute of British Architects**, was held on Sunday, December 2, at Birmingham. Bristol, Exeter, Leeds, and Manchester in the 10th and 11th ult. One hundred and eighty-eight candidates were admitted, and 37 were exempted from sitting. The remaining 151 were examined, with the result that 114 candidates passed, the remaining 37 being relegated to their studies. The Intermediate Examination, qualifying for the **Prize of the Royal Institute of British Architects**, was held simultaneously in London, Bristol, Leeds, and Manchester, on the 5th, 6th, 7th, and 8th ult., with the result that of the 79 candidates examined, 45 passed, the other 34 being relegated. Mr. Archibald Scott, of Brook-park, Dennistown, Glasgow, was placed first in merit in the latter examination by the Board of Examiners. Mr. Charles Melville (Crickier, of All-wood, 16-20, Park, coming second, and Mr. Herbert William Asman, of Randall-terrace, Bradford, third. The Final and Special Examinations, qualifying for candidature as Associate R.I.B.A., were held in London alone from the 15th to the 22nd ult. Sixty-two candidates were examined, of whom thirty-seven passed, the others being relegated to their studies. On the recommendation of the Board of Examiners, the Council of the Institute have decided to award the Ashpitel Prize to Mr. Charles Thomas Ashad, of Stockport, he having most highly distinguished himself in the Final Examinations held during the current year. On the recommendation of the Board of Examiners the Council have also awarded a Prize of Books of the value of £10 to Mr. F. Doris Clapham, of Eltham, in recognition of the merit displayed by him in his work at the Special Examination held last June. Mr. Clapham obtained the highest number of marks ever awarded at the Final and Special Examinations.

Several noteworthy additions have recently been made to the collection of paintings in the National Gallery at Trafalgar-square. A large altar-piece, by Luca Signorelli, representing the Virgin crowned by angels, attended by St. Sebastian and St. Jerome on the left, and St. Christina and St. Nicholas of Bari on the right, with a landscape background, representing Lake Trasimene, recently purchased, has now been placed in the Umbrian Room No. VI. A portrait of a young man, signed and dated 1617, by Abraham Rembrandt, portrait-painter and writing master to William III., representing possibly the same individual as pointed by Terburg, apparently about twenty years later, in the picture No. 1,339 in the National Gallery, has been purchased and is placed in Room XI. The picture here mentioned is the only known work of this painter. A small panel, representing the Adoration of the Magi, by Benedetto Bonfigli, was purchased and placed in the Umbrian Room during the summer. A painted sketch for a ceiling, by Sir James Thornhill, representing an incident in the life of St. Francis, has been presented to the Gallery by Mr. Charles W. Dopson, and is hanging in Room XIX. The gallery has received, at request from Mr. Charles Wood, a picture by Paris Bordone, representing the Saviour as the Light of the World: it is hung in the Venetian Room No. VII.

Some fire tests were carried out on Wednesday by the British Fire Prevention Committee at their new testing-station, 65, Porchester-road, Fayswater, with hardwood doors, the object being to ascertain the comparative fire-resisting power of oak and teak doors, and of doors constructed of Australian kurri and jarrah wood. For this purpose two brick huts had been erected, one fitted with oak and teak doors, and the other with single kurri and jarrah doors, each pair of frames being set 10 in. apart with 1 in. brickwork between them. Gas-pipes were laid on each building, and the gas having been lighted, the doors were closed and ignited, in order to produce heat which would ignite them. After the lapse of an hour and a half, when the temperature had for a considerable time exceeded 2,000 Fahr., the oak and teak double doors caught fire and were soon burnt out. The single doors of kurri and jarrah resisted the fire for an hour and a half, and were partly consumed. It was expected by the promoters of the experiments that these latter doors would have withstood fire for a longer period of time, and it was claimed that

this would have been the case had the doors been properly made. This experiment was not considered conclusive, and a further test with differently constructed doors will probably be made.

Mr. C. M. FREEMAN, K.C., in a paper read before the Architects' Institute on Wednesday evening, discussed the legal aspect of some questions of interest to property owners likely to be affected by the tubular railways. He pointed out that it has become customary to insert in contracts relating to railways a clause enabling the promoters to take any necessary easements over lands, thus relieving them of the obligations under the ordinary law to pay for the land taken (which obligation they would not avoid by going in tunnel, inasmuch as the ownership of land goes down to the centre of the earth), and to acquire a building under any portion of which their lines pass. Parliament, he remarked, seems to have acted in the belief that the soil of the streets under which, in many places, these railways are laid, belongs to the local road authority; but it has been clearly laid down that only such a depth beneath the surface of a highway is vested in the local authority as is necessary to enable it to repair the thoroughfare and to conduct necessary sanitary works, and that all below such structure remains the property of the adjoining landowners. As soon, therefore, as any portion of such subsoil is taken for the purpose of works, Mr. Freeman said, the adjoining owner is entitled to claim for damages caused to his property by either the construction or the working of the railway, but the enforcement of such a claim he described as presenting considerable difficulties. Subject to a modification of the law in that respect, Mr. Freeman said he thought the enormous benefits such railways will confer upon travellers might be secured without violating the great principle of English law, that a public improvement is not to be carried out at the expense of the individual.

The London County Council has this week issued a report on shallow underground tramways, which contains a joint report by the tramways manager and the electrical engineer of the Council on the construction and working of the Boston (U.S.A.) Subway, and on the Rapid Transit Subway now under construction in New York, and an addendum by Mr. J. Allen Baker, vice-chairman of the Highways Committee. The report is illustrated with maps and reproductions of photographs of existing shallow underground tramways, similar to that which it is proposed to construct from Southampton-row to the Thames Embankment.

An exhibition of students' work was opened at the Camberwell School of Art on Tuesday, and will remain open daily, between 2 and 9 p.m., until Monday evening next. The institute was founded three years since by the Technical Education Board of the London County Council, by whom it is maintained, the pupils receiving their instruction at the hands of Mr. W. B. Dalton, the head master, assisted by a staff of eighteen teachers, in a part of the South London Art Gallery, Peckham-road, lent them by the Camberwell Borough Council. The exhibition comprises specimens of architecture and building construction, masonry, modelling, plastering, stone carving, lithography, lettering and enamelling, decorative painting, sculpture, embroidery, bookbinding, decorative design, cabinet-making, and pen-and-ink work for book illustration. There are about 300 students in the school, the most popular branches being those of cabinet-making, book illustration, and stone carving.

In the twenty-ninth report of the Ecclesiastical Surveyors' Association allusion is made to the last practice of dilapidations. At the request of the practice committee of the Royal Institute of British Architects they had furnished a report on ecclesiastical dilapidations, to be embodied in the new book on dilapidations to be issued by the Institute. The secretary to the Ecclesiastical Commissioners submitted to the joint Parliamentary Committee the substance of Queen Anne's Bounty Board the old scheme for insuring dilapidations first set forth in 1876 before the Committee of the House of Commons at the mouth of Bishop Magee. The hon. secretary of the Association felt it necessary to take some action so as to prevent such a scheme receiving the sanction of the committee after much consideration. It was to be regretted that the Archbishop of Canterbury spoke publicly in

favour of the scheme, though there was internal evidence in his remarks that he had not apprehended the whole case. It is probable, continues the report, that the present Conventions and Parliament will ultimately discover, like their predecessors, that the clergy are most advantageously dealt with under the existing Act, and that no serious alteration of the law is needed or even possible.

A DINNER was given on Tuesday night at the Haberdashers' Hall, by the Plumbers' Company, to the Lord Mayor and Sheriffs of London. Mr. Charles Hudson, Master, presided. Lord Glenesk, in responding to the toast of "The Houses of Parliament," referred to the Plumbers' Registration Bill, which it was the earnest desire of the Plumbers' Company to see passed into law, and confessed a hope that he might be able to assist them in their good work in the coming Session of Parliament. He regretted the delays which the measure had met with in the past, but hoped that its progress through the House of Lords would be rapid. That House was a House of quick business and a house of ready action, and would, no doubt, be rapidly disposed of there. Mr. Duke, M.P., responded for the House of Commons. The Lord Mayor proposed "The Plumbers' Company and its Public Work," to which the chairman responded.

An order recently issued by the President of the Board of Education directs the removal from the Geological Museum in Jernyn-street of the very fine collection of china and pottery, which has for many years been one of the principal features of this museum. It has been a debatable point whether such a collection was not out of place in a purely geological museum, and it is accordingly being dispersed. A part has been directed to the Bethnal Green Museum to be there exhibited, but many specimens will be available for the loan collections in the provincial museums, and a selection will shortly be made for that purpose.

The thermal expansion of cement has been studied by Carl H. Au in the physical laboratory of the Polytechnic Institute at Worcester, Mass., with results corresponding to those of other experimenters. A bar of Portland cement was placed under water in a cylinder, and the water gas-jets along its whole length. The changes of length were observed by means of two reading microscopes focussed on the points of needles imbedded in the bar near its ends and projecting out of the water. Two thermometers were used to measure the temperature, and during each observation the temperature was kept as nearly constant as possible until the readings of the microscopes ceased to change. Readings were made at seven temperatures between 8° and 70° C., and the coefficient and linear expansion per degree was found to be 0.000115; this result is believed to be accurate within 2 per cent.

Men's interest was aroused last spring among archaeologists by the discovery of a great palace on the site of Phaestus, in the south of Crete, by the Italian archaeologists Hawthorn and Perad. Since the departure of the Italians for the autumn, peasants have lighted on a series of rock tombs in the neighbourhood of the palace. These tombs, which are both of the dome and the vaulted type, contained several skeletons apiece, and were adorned with painted objects, such as necklaces, rings, in which are set engraved gems, representing cult-scenes, demons, and other typical Minoean subjects. Hitherto no tombs have been found pertaining to the great Cretan palaces, and it is only in tombs that the richer phases of Cretan civilisation are definitely and exclusively conceded to the Italian Mission. The Cretan Government, on hearing of the first find, sent M. Xanthopoulos to the spot, and he has continued the peasants' work. This action has been followed by a protest from the Italian Minister for Foreign Affairs on the ground that the objects and civilisation are definitely and exclusively conceded to the Italian Mission, who contemplate the resumption of the palace-excavations in the coming winter.

The Bolton Town Council accepted on Monday a gift from Mr. W. H. Lever, of Thornton Manor, Cheshire, of about 300 acres of land at Rivington, for a park, the site including the historic Rivington Pike, which commands views of the distant sea, and was used as a beacon at the time of the Armada.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Surveyors' Institution. "Artificial Manure," by Professor W. S. R. 8 p.m.
Society of Arts. "Chemistry of Construction Materials and Processes," Cantor Lecture No. 3, by William Baze, 8 p.m.

British Society of Architects. "Paris, Past and Present," by Harold Smith, A.R.B.A. 8 p.m.
Clerks of Works' Association. Monthly Meeting. Paper by T. Stirling, jun. Carpenter's Hall. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "Train Resistance." 8 p.m.

Northern Architectural Association. "Terracotta," by J. Miller Carr. 7.30 p.m.

Cardiff and South Wales Architectural Society. Paper by J. G. Jones, A.R.B.A. Art Society's Rooms, Cardiff. 8 p.m.

WEDNESDAY.—Society of Arts. "Aluminium," by Professor Ernest Wilson, M.Inst.E.E. 8 p.m.
St. Paul's Ecological Society. "Suggestions for the Reconstruction of the Coronation Ceremonies," by Leopold G. Wickham Legg, A.R.A. St. Paul's Chapter House, E.C. 8 p.m.
Oreola College, Manchester. "Municipal Bodies and the Corporation," by Reginald Blomfield, M.A. 5.30 p.m.

THURSDAY.—Leeds and Yorkshire Architectural Society. "Village Churches of North Devon," by Rev. H. Armstrong Hall. 6.30 p.m.

FRIDAY.—Architectural Association. "A Travelling Student's Notes," by J. E. Forbes. 7.30 p.m.

THE ARCHITECTURAL ASSOCIATION.

DECEMBER 10th.—ORDINARY GENERAL MEETING at 10.15, P.M., in the Grand Room at the Hotel, 11, F. F. FORBES, illustrated by lanterns. Notes, by Mr. J. E. FORBES, illustrated by lanterns. Notes, by Mr. J. E. FORBES, illustrated by lanterns. Notes, by Mr. J. E. FORBES, illustrated by lanterns.

CHIPS.

The new convalescent home, which is being erected at Felixstowe at a cost of £12,000, as a branch of the London Hospital, is rapidly nearing completion.

Mr. J. H. Staphop has been appointed engineer in chief of the Central Telephone Exchange in London.

Mr. Peter Bibby, architect, Flint, has been appointed on the commission of the peace for the county of Flint. Mr. Bibby was formerly a member of the borough bench of magistrates.

Mr. James A. Fakin, who has resigned the post of waterworks engineer to the Corporation of Halifax, is, subject to confirmation by the T.C., to be retained as consulting engineer for a term of years at the salary of £100 per annum.

The Bishop of Lincoln dedicated the new church of St. Mary Magdalene at Penley, near Eilemore, on Friday week. The new church, which takes the place of an old and dilapidated structure, has been designed by Mr. Hodgson Fowler, of Durham, at a cost of £2,500. It consists of nave and chancel of local red stone, with a roof of red Russian tiles; the chancel fittings are of solid oak, all the seats, to accommodate 135 persons, being free.

The new church at Swanley Junction will be consecrated on Thursday in next week the 12th inst. by the Archbishop of Canterbury.

The Port Sanitary and Hospitals Committee of the Liverpool Corporation propose to seek power to borrow three sums of £5,500, £1,000, and £9,000 for increased accommodation at Fazakerley, and £3,500 for furnishing the extension of the City Hospital East, Mill-lane.

The Bristol Board of Guardians have adopted the recommendation of a committee as to the plans for the new workhouse infirmary. The original estimate of the architect, Mr. H. Percy Adams, of London, for the building alone, was £123,385. New plans are now to be forwarded to the Local Government Board for their sanction, the revised estimate of cost being £142,000.

The Queen Victoria Memorial Fund at the Mansion House now amounts to £182,000. It is thus steadily creeping up to the £250,000 aimed at by the promoters of the scheme.

Mr. W. G. John, A.R.A., has presented to the Devonshire Hospital at Buxton a replica of the colossal seated statue recently unveiled at Eastbourne of the late Duke of Devonshire. The statue is being erected under the dome.

The Lynton Urban District Council have retained the services of Messrs. Bond, Wood, & Son, civil engineers, of Westminster, to prepare a scheme, with report and estimate, on the water supply of the district.

The Scarborough Master Builders' Association held their annual meeting on Monday. The president (Mr. A. W. Sinclair) was re-elected.

The death is announced of Mr. F. W. Bunt, late chairman of the French Asphalte Company.

In the death of Mr. James Ingick, of this firm of A. Inglis and Sons, joiners, Huddersfield, 1392, a public-spirited citizen. He took a great interest in Church matters, and was an elder in East Bank United Free Church.

A scheme is on foot to build a new market-hall at Stockton, at a cost not exceeding £15,000.

A Local Government Board inquiry was held at the Parkside Hotel, West of the direct of the South-Eastern Metropolitan Tramways Company, on Tuesday, into the application of the Cheshire County Council for sanction to borrow £51,914 for the erection of an infirmary annex, and £1,600 for alterations to the bakehouses of the asylum.

The Highways Committee of the London County Council report what the directors of the South-Eastern Metropolitan Tramways Company are willing to recommend the shareholders to sell their undertaking to the Council, by agreement, for £50,000, which the committee are advised is a fair and reasonable price. The company's tramways are, at one point, in close contiguity to the Council's tramways. The undertaking would not become compulsorily purchasable until 1903. It is proposed that on January 21, 1902, a meeting should be made special for the passing of the necessary resolutions.

A new wing is being added to Grindon Hall, the residence of Sir Theodore Dorset, M.P., and new stables are being built.

The school board for Bangor have decided to invite competitive plans from architects practising in that city for an infants' school for 300 children to be built at a cost not exceeding £3,000, on a site on the Ffairs Estate. Designs must be sent in by January 31.

The workshop of Messrs. Henry Lovatt and Co., contractors for the new naval barracks at Portsmouth, were destroyed by fire on Sunday. No damage was done to the barracks.

At Wallall Guildhall on Tuesday Colonel W. R. Slacke held an inquiry on behalf of the Local Government Board into an application by the town council for sanction to a loan of £1,480 for surface drainage works. Mr. J. H. Middlemore, the borough surveyor, explained the plans.

Mrs. Thomas W. Speight was at Dewbury, on Tuesday, granted a separation order with £18. a week against her husband, on the ground of desertion and persistent cruelty. She said he was an architect by profession, and since last June he had not given her a penny for the support of their three children.

The town council of Warrington decided, on Tuesday, to apply to the Light Railway Company for sanction for an order authorising the construction of a light railway from Widdersop Causeway to Stockton Heath, and one from the market-place at Stockton Heath to Knutsford-road, Latchford.

The Council of Londenborough laid, on Tuesday, the foundation-stone of the new church of St. Saviour's in the town of Londenborough, the populous North-west Ward, Scarborough. The church will be Early Decorated in style. The cost of the portion of the structure now being proceeded with will be £3,600.

Mr. H. Prosser, M.S.A., surveyor to the Walthamstow Sanitary Board, has been unanimously appointed architect and surveyor to the board at a commencing salary of £250 per annum.

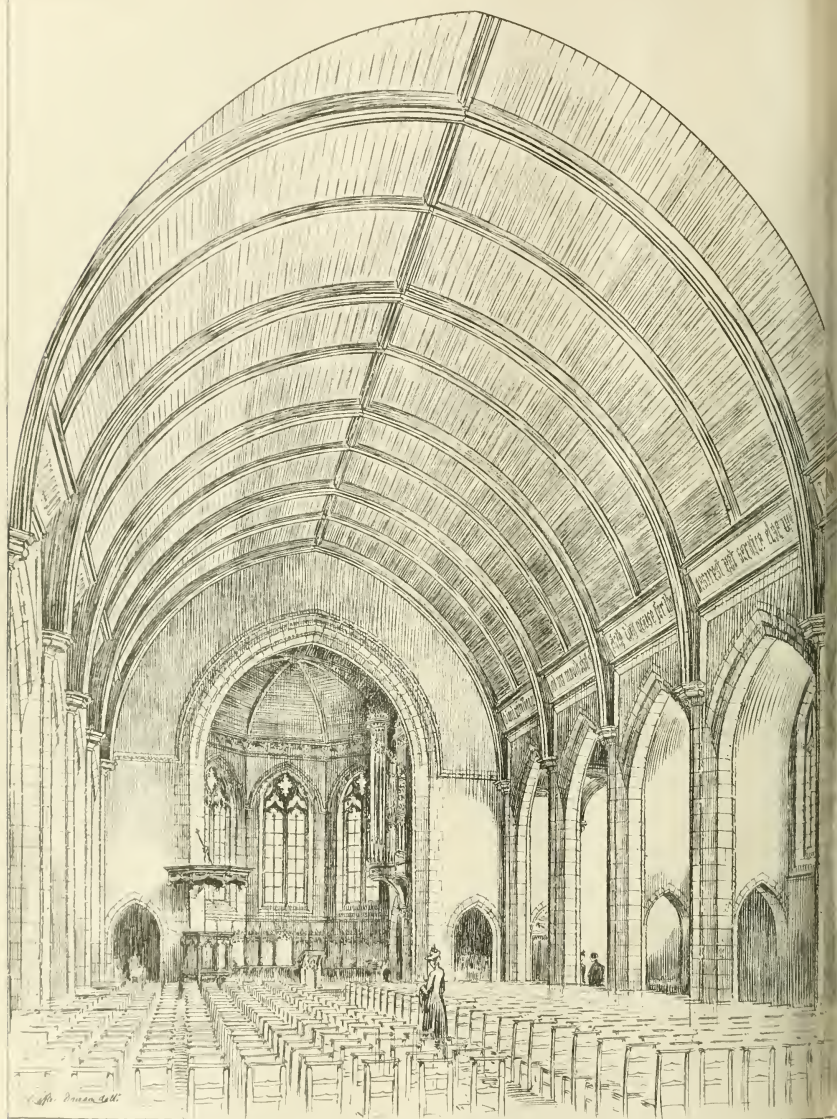
The Folkestone corporation are about to call a special meeting to consider a drainage scheme estimated to cost over £45,000.

A conference on the housing question, under the auspices of the Local Law Reform Association, was held on Tuesday at the Westminster Palace Hotel. Sir W. Foster, M.P., presided. Mr. R. J. Price, M.P., read a paper on "Housing in the Rural Districts." Mr. F. A. Channing, M.P., moved a resolution urging various measures for the better provision of house accommodation in these districts, which was carried after a long discussion. Sir J. Dickson-Poynder, M.P., read a paper on the housing question in the urban districts, and a resolution on that subject was moved by Mr. T. Lough, M.P., supported by Dr. Macnamara, M.P., Dr. Clifford, and others, and carried.

A further step in the conversion of the system of tramways between Fulham, Bury, Deptford, and Nelson, and the London and South-Eastern Railway, was taken on Tuesday night, when the first official trial trip was performed by one of the new cars. The trial, which was over a considerable portion of the Bury section of the line, proved satisfactory.

Mr. H. P. Carter, M.Inst.C.E., of the Local Government Board, held an inquiry at Morecambe on Tuesday into the application of the urban district council to borrow £5,000 for electric lighting purposes, £1,035 excess expenditure on the refuse destructor, and £200 excess expenditure on street improvements.



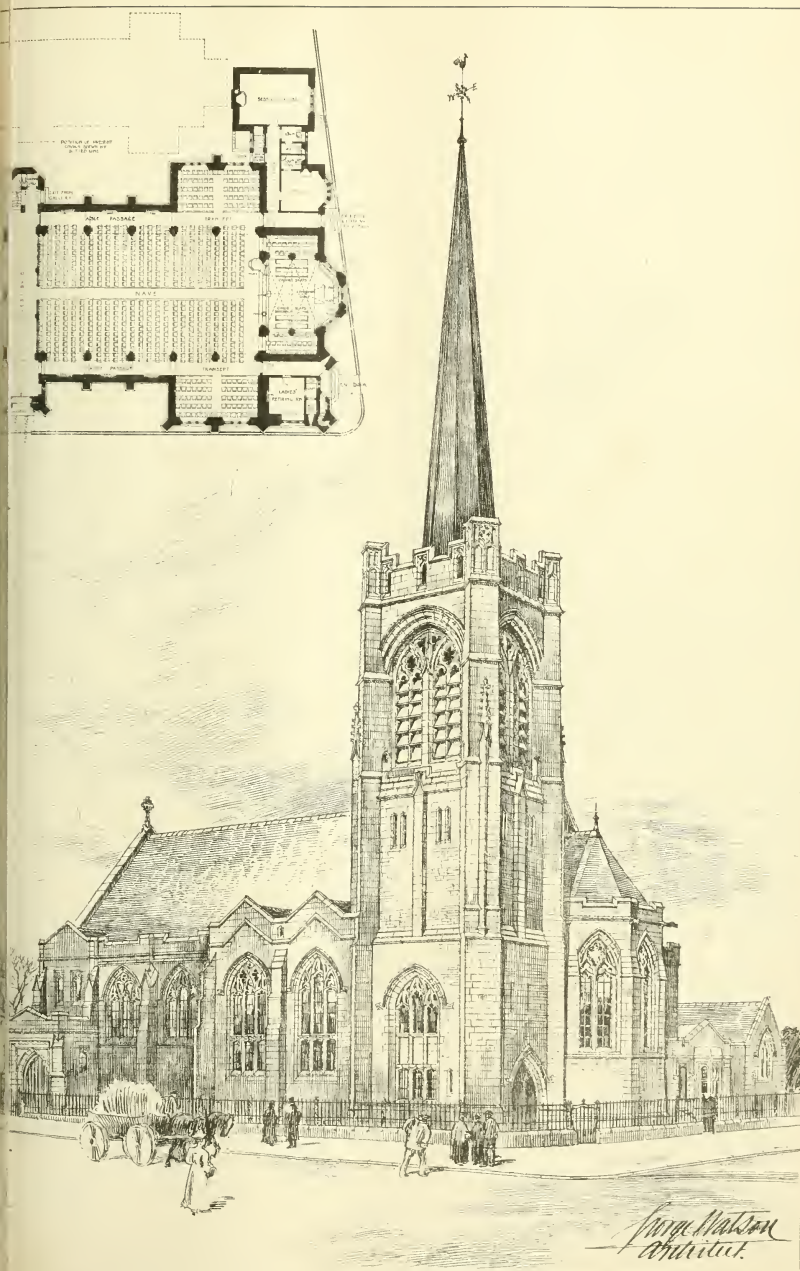


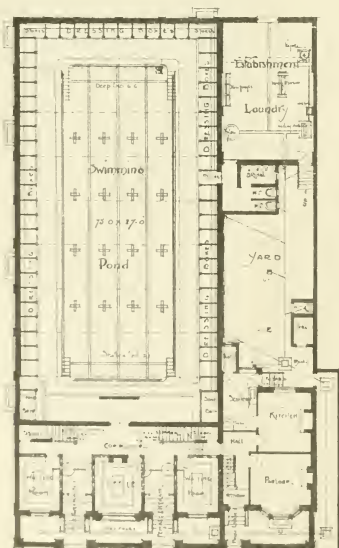
Church of St. Serf

Interior View, towards

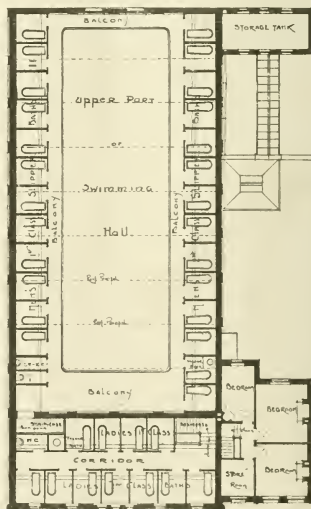
Goldenacre.

the East.





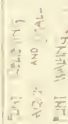
Ground Plan



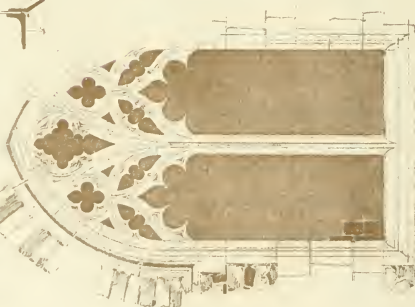
First Floor Plan



DETAIL OF THE WINDOW MOLDINGS



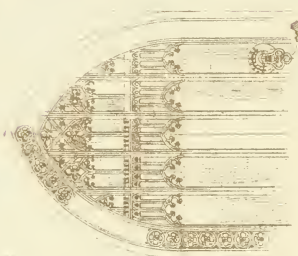
DETAIL OF THE WINDOW MOLDINGS



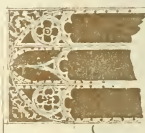
CAVTON - CHURCH - NORFOLK
DETAIL OF WINDOW TO ROZEM
ALSO CROSS AND ROCKET



As shown in the
Detail - Note 9th



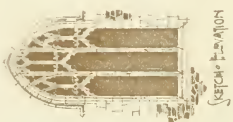
OAK DOOR AT
WALSHAMPTON
NORFOLK
DETAIL OF GROUND
DECO: on CORN
TO CHANCEL



1st
2nd
3rd



DETAIL OF THE
DOOR MOLDINGS



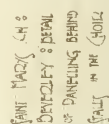
DETAIL OF WINDOW



DETAIL OF WINDOW



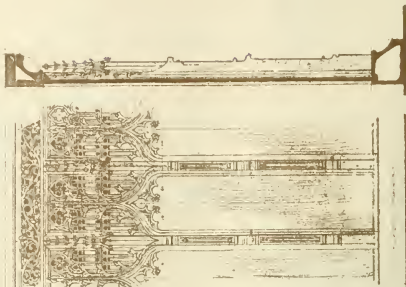
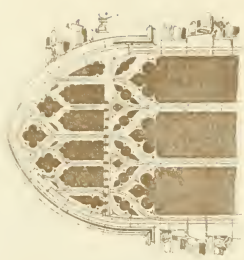
DETAIL
OF DANCING
BEHIND



DETAIL OF WINDOW
OF DANCING BEHIND
GALLY IN THE CHANCEL

IN DARK OAK

CAVTON - CHURCH - NORFOLK
DETAIL OF WINDOW AT ALTAR END



DOOR DESIGN
CAVTON

QUEEN VICTORIA MEMORIAL. ST JAMES' PARK, S.W.
GATEWAY FROM SPRING GARDENS.
DESIGN BY D^R ROWAND ANDERSON, ARCHITECT.



THE BUILDING PEWS. DEC. 6, 1901.

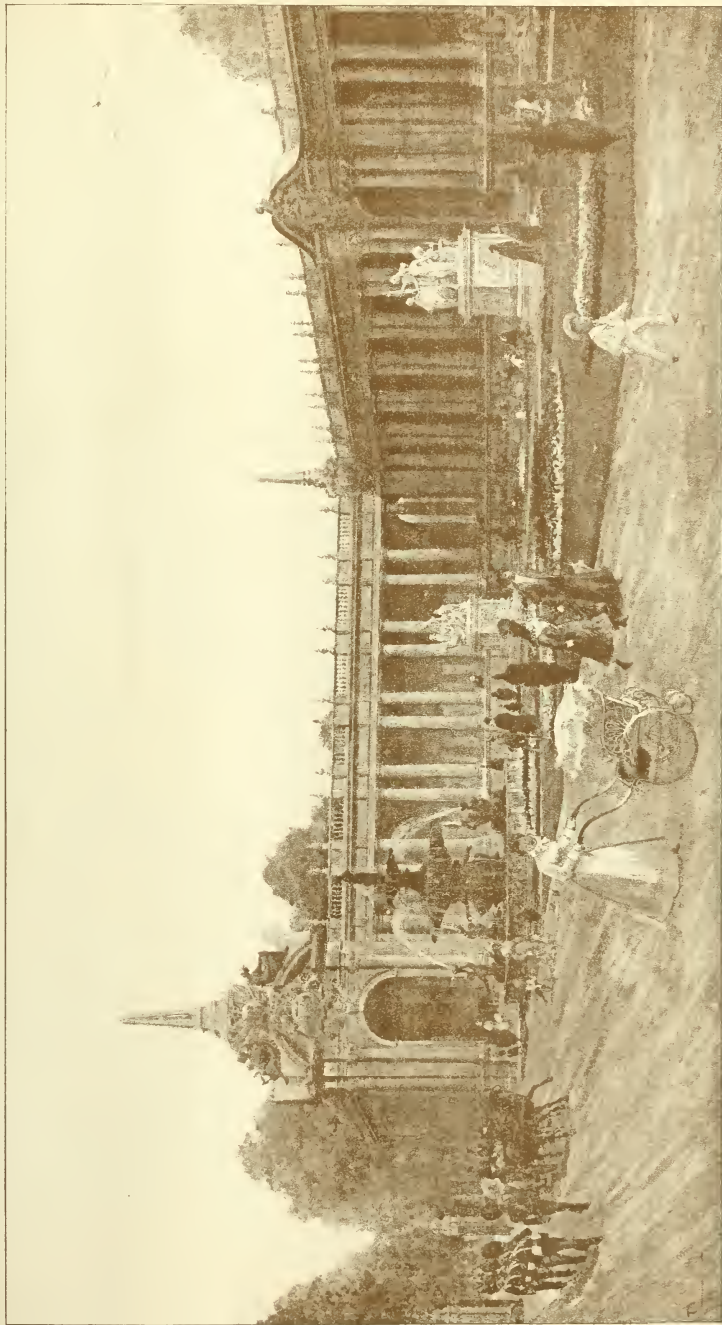
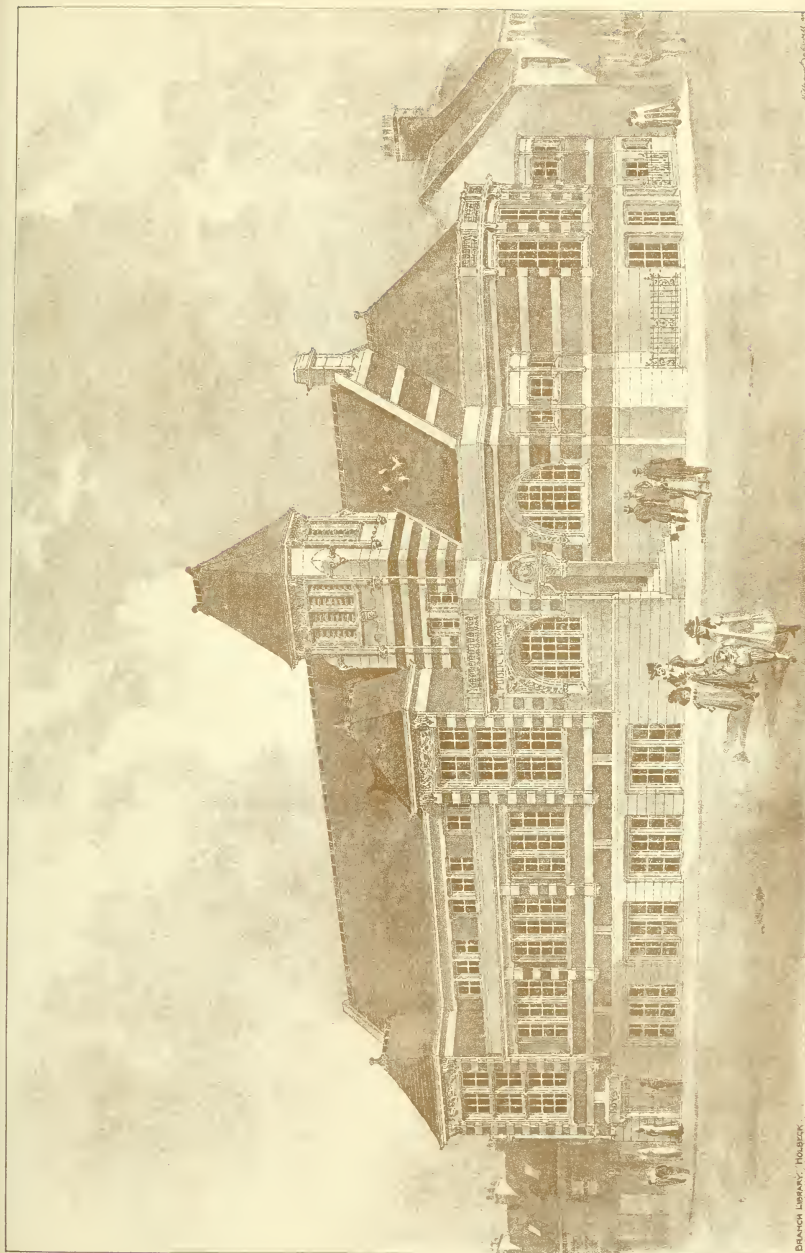


Photo taken by James A. H. & Co. for the Architect.

QUEEN VICTORIA MEMORIAL. BUCKINGHAM PALACE.
VIEW IN THE QUEEN'S GARDEN
DESIGN BY T. G. JACKSON, R.A., ARCHITECT

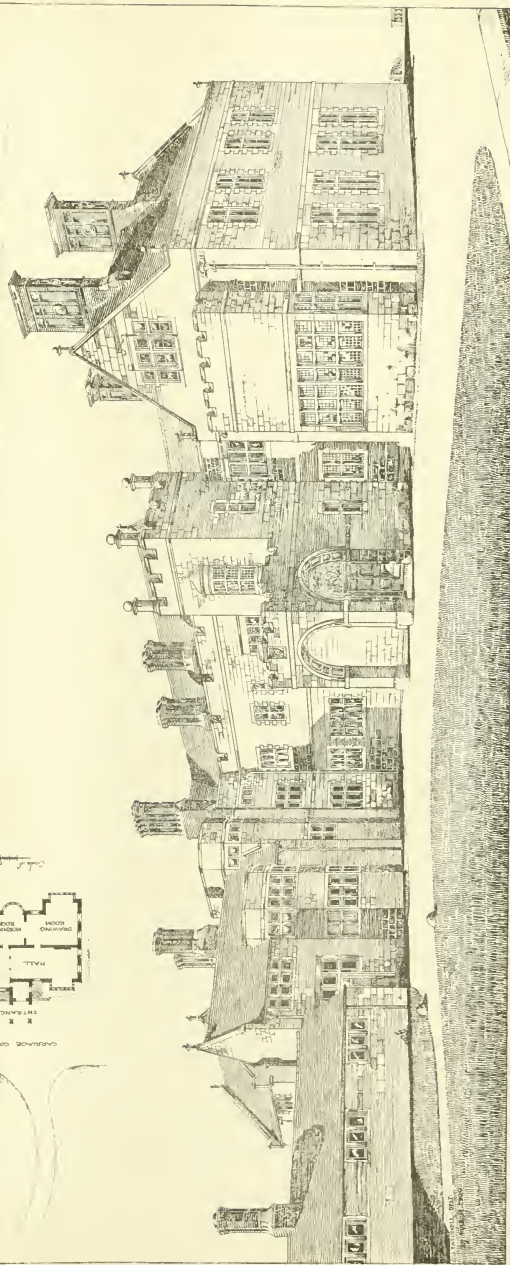
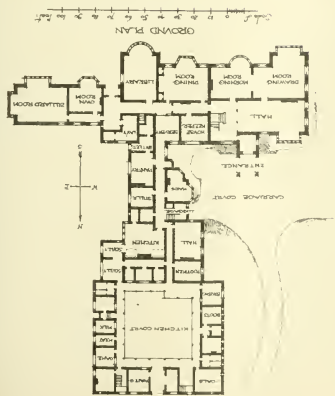


NEW BRANCH LIBRARY HOLBECK LEEDS W. BAKWELL FRIDAY APRIL 1.

BRANCH LIBRARY, HOLBECK

"Photo. Taken" by James Harrison of Leeds.

WHITNEY COURT,
HIERFORDSHIRE.
VIEW FROM NORTH-WEST.
THOMAS HENRY WATSON : ARCHT.



THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXXXI.—No. 2449.

FRIDAY, DECEMBER 13, 1901.

POSITION AND PROSPECTS OF THE PROFESSION.

IN his interesting Presidential address on the "Past, Present, and Future of British Architecture," before the Northern Architectural Association, Mr. Frank Caws, F.R.I.B.A., said: "The truly successful modern architect must of necessity be an artist, scientist, and commercialist"—three very distinct and to all experience irreconcilable qualifications. And yet this combination of talents is actually found in many successful leaders of the profession. Of course, it does not mean that an architect is expected to be a master in each of these arts, but that his character of mind should be comprehensive enough to be able to perceive the demands made by each of these three things. If art is considered as sentiment (it is something more than that), science may be considered a mind capable of investigating facts and drawing conclusions therefrom—a mathematical mind, and commercialism is another name for business methods. In the absence of a more precise description of what a successful architect now requires, we may take this as a fairly good one, as it sums up three important sides of an architect's mental equipment for his work. It is a happy combination of these qualities that insures success. But the usual distinction of these separate talents by nature is to make one man an artist who cares little for science or construction, and with an utter disregard of business duties; another an ingenious constructor, skilled in the mechanical part of his profession, but without any artistic power; a third a man of business chiefly, who assumes the title of architect, for which he has no special qualification except that of drawing and keeping clients. The subject of business aspects has received attention in the address of Mr. Silvanus Trevail at the Society of Architects. It is the provincial architect who has to bear the neglect of his more favoured London *confères*, who meet in conclave and discuss the requirements of the profession. To a certain, but to a much larger, degree the provincial practitioner shares the fortune of his colonial brothers in large countries like Australia, where the bond of brotherhood or professional unity is scarcely known, but where each one is fighting for himself as an individual. It is a hapless condition of things in a great colony where a few handfuls of architects only are found to band themselves together amidst thousands who profess the same calling and name. To a certain degree the country architect is in a singular position. He probably does not belong to any society who can hear his complaints or make his wants known by taking up practical matters. In our great towns—especially London—the architect's position and claims are better known: he assumes at least a place among other professional men—lawyers, medical practitioners, and others;—he is generally a member of some professional society, and his wants are better known and looked after. Then the architect's business, as was pointed out by Mr. Trevail, is more defined than in the country: the public recognise an architect to be a man versed in the science and principles of his art, to be an expert in building, though this idea may be rather vague. In the country, if we take the average practitioner, his whole environment is different; his profession is more nebulous in the eyes of those who dwell in the district; few know exactly his qualifications;—the consequence is

his plans and designs are regarded as mere drawings of imagination, his advice is unheeded, and even his charges, if based on the professional schedule, are sometimes disputed. In country towns the architect loses his status; his attainments as an artist and man of science are disregarded. We have the same complaints from the Colonies, though in a worse degree—the architect is put on a par with the builder or charlatan who offers his services for a trifle, or a jerry-builder. Mr. Trevail, in his recent remarks, alluded to one serious drawback the country architect has to contend against—namely, the plagiarism practised by local officials. It is an old complaint that the office of the local surveyor or engineer in small provincial towns supplies designs for buildings, which properly ought to be prepared by a local architect; that by virtue of the local by-laws, which require deposits of plans, the official surveyor or an assistant on the staff is enabled to prepare a design according to the taste of the client, and far more expeditiously than any obtained elsewhere. If an employer can be persuaded that delay and difficulty of passing the plans is avoided by this course, he is not likely to object to an independent professional practitioner in preparing designs. Many instances occur of plans having been prepared and returned for revision for very small and inadequate reasons. The private practitioner is not only obliged to prepare a set of plans for deposit, but they must be in duplicate—one set to be retained. One of the grievances of the practitioner is that the authority or their surveyor can require elevations as well as plans and sections, and thereby records of all the best architects' work in the district are obtained which can be made use of when occasion offers. The copying of deposited plans has been a long-standing complaint. We do not believe ourselves it exists to any great extent, for no official surveyor of any repute would think of lending himself to such a practice; and the only way it seems likely to be followed is that a member of a local surveyor's staff, who also does private practice, may take advantage of the opportunities afforded him. But the opportunities are not numerous. Local surveyors and their staff are generally too busy to undertake private work, and we are of opinion that a rule to prevent private practice exists in very many instances. Every protection should be afforded the architect in the pursuit of his profession, in jealously guarding his interests against local authorities and usurpation; and for this reason we think it unjust that municipal buildings of any kind, with any pretension to architectural design, should be entrusted to the local surveyor or borough engineer. Equally objectionable is the existence in the provinces of untrained men who compete with the qualified practitioner on the most unfavourable terms; men who have never entered the profession in a regular way—largely builders, clerks, estate agents, dealers, &c., and who force their attention on would-be employers about to build, and agree to carry out the whole building for a certain sum. The qualified man is helpless against such competition, and with no protection, such as registration would afford him. It so happens that the charlatan is often a good commercial man—a man of energy and pushing qualifications, with a medium of common sense which just goes to make up two of the necessary qualities we have referred to, and which are more than a match for any artistic power. We could name many instances of persons of this stamp, with the aid of a builder, who is taken into confidence, have been entrusted with gentlemen's residences, business premises, and farm-buildings. To get drawings made is the easiest part of the work; to arrange a contract or to get material and labour are matters which such a pretender can easily

accomplish. He has little scientific method or scrupulousness in his work. As Mr. Caws says: "The commercial architects employ artists to design their façades and interiors, and engineers or able contractors to solve their structural problems, while they absorb the bulk of kudos and cash." Others "bribe clients to employ them by offering services at rates of remuneration below the rates fixed by usage," and, it may be added, make up their remuneration by commissions obtained from tradesmen to the injury of the client. These are obstacles that beset the provincial architect, who is often a man of general qualifications and of practical knowledge in structural matters. He has acquired presumably a knowledge of local materials, of measuring and estimating works; can prepare quantities, make valuations for various purposes; and can prepare plans for various buildings, though his knowledge may be restricted. Experience has proved that, of the three qualifications we have referred to, the most important for the provincial practitioner are the practical and commercial; the least required and remunerative—the artistic. His art accomplishments, if he has any, are largely discounted. All important buildings like churches, town-halls, and gentlemen's residences on a large scale are placed in the hands of London men, who frequently know little of the local material and practice. And it is the same with buildings where specialist knowledge is necessary—workhouses, baths and washhouses, breweries. The provincial practitioner is not so well in touch with the details of such work as his brother in a large centre; but there is no reason why he should not be. His great need is affiliation with a society or architectural body of some central town, where he could make his requirements known and would place him in touch with the latest developments, and with the best work and literature of his profession. The position and prospects of the architect in the future will much depend on his ability to comprehend the three aspects of his profession we have noticed. The practitioner in London may be content to be an accomplished artist or specialist; but the provincial architect must seek by co-operation to assert his qualifications in all three aspects of art, scientific knowledge, and business aptitude. Protection from the incompetent must be found in a general statutory qualification applicable to all who practise, so that all incompetent, at least in the fundamental parts of the profession, are excluded.

STANDARDS IN BUILDING.

ONE of the consequences of that law which is expressed by the "survival of the fittest," and which appertains to building as to all organised types is that long series of modifications or adaptations of plan and structure lead naturally to certain standard units of dimension, of proportion, and form. In the natural and organic world we find certain fixed types that have survived all changes; so in architecture in the course of ages particular types and forms have come down to us that appear to defy further change. Would-be inventors of new styles have found, to their disappointment, that they cannot improve on the old: they may change the form or proportion of a feature or a detail only to make it less useful or ornamental; or they may invent something altogether different that will not "go down," but seems ridiculous or exaggerated, and those who have experimented in this direction have discovered that they cannot produce anything better for the purpose, say, of a moulding or cornice than that which has been handed down by the Greeks and Romans, or a better form of roof than that constructed by the Middle Age builder. A more practical application of this principle or law is

observed in the adoption of forms and sizes for such things of everyday building as rooms, windows, doors, fireplaces, sections of beams, scantlings, and a hundred other things. These matters are so commonplace that few think anything about them. The occupant of a room does not trouble to think about the size and proportions of his windows, doors, and fireplaces;—they seem a matter of course, but really they have come down to him as the net results of centuries of use. He probably does not think that he cannot materially alter their dimensions or proportions without inconvenience, and destroying the effect of his room. So the practical bricklayer accepts without examination the ordinary size of his bricks; he cannot make them larger or alter their proportion without adding much to his labour. The standard brick is a convenient unit for handling, for bonding, and is, of course, the basis of measurement and of wall thickness. To alter the London stock-brick size means the use of a different rule of bonding and of our units of measurement. Although in other parts of England the brick is made a trifle larger, the difference is very small, showing experience has fixed upon a particular size and proportion. So it is with the carpenter and joiner; he has certain fixed measurements derived from the sizes of deal standards—planks, deals, and battens; his scantlings are generally of given dimensions, and he works according to certain proportions and thicknesses which have been found convenient. Thus his floors are laid to certain thicknesses, and his timber framing, as his doors, are regulated by proportionate dimensions into rails and stiles. Except that they are convenient, and easily remembered, he does not much trouble; but they have been the result of experience. Now we may apply the same principle to usual standard proportions of our buildings, and we must first take the room. Its varying uses have to be considered; but there is a tendency to adopt a given standard of proportion, according to its purpose. An oblong shape is generally adopted; but the dimensions, of course, will always be regulated by plan and site and other circumstances. The room unit becomes more fixed or defined in buildings planned for a given use for a large number of persons. In a row of labourers' cottages, almshouses, dwellings in flats, the dimensions are fixed according to a standard. Thus in the Boundary-street area the Secretary of State adopted an area of living-room of 160sq.ft., and for bedrooms 110sq.ft., and these figures were adopted as a standard; but the enormous demand for working-class dwellings compelled the L.C.C. in 1899 to reduce to the minimum size of rooms previously laid down for living-rooms 144sq.ft. and for bedrooms 96sq.ft. and according to these areas the dwellings have been built. These areas would give rooms of 12ft. square and 12ft. by 8ft. respectively. So in Poor-law buildings for cottage homes, the standard size for rooms is regulated by the number of children accommodated. When the number of children is fifteen or less, and the number in each bedroom is six, the amount of space per child is put at about 30ft. to 36ft. of floor area, and 300c.ft. of air space as a minimum, the height of bedroom being 8ft. 6in. to 9ft. Thus we find single cottage homes at Bridgend with a day-room 15ft. by 15ft., and bedrooms 18ft. by 15ft. and 16ft. by 11ft. for girls and boys respectively. Again, in workhouses, adult day-rooms are planned to allow 15ft. of floor space per space; for a general dining-hall a floor space of 6ft. is allowed for each person. The standard size of sleeping wards is regulated by the space allowed per bed, the ordinary sick requiring a floor area of 60ft. with cubic space of 600c.ft. and wall space of 6ft.; and for offensive cases 80ft. floor space and

900c.ft. These dimensions, based on hygienic experience, regulate the size of the ward. The rational unit is this in one case 10ft. by 6ft. by 10ft. high, which gives the 600c.ft., so that every ten beds would require five on each side, or a ward 30ft. long by 20ft. wide. In these and other classes of buildings, where there is a multiplication of parts, the tendency of unifying the size and shape of rooms is more apparent. They assume a more definite shape in any large aggregation of tenements or rooms. But it is more in relation to other minor features that we find a general tendency to follow certain standards of form or dimension. Take the window. In the more important buildings of a public commercial and private character, the proportions and size of windows vary according to design, to style, and to other conditions; but, taking the general run of buildings, houses of the middle and lower classes in our streets, the window does not vary much in size or design; it is the plain sash window of the conventional joiner's type, of certain thickness, length, deal-cased frames double-hung, with oak sills and moulded sashes, in which every part is machine-made. The very necessities of the builder in a large way of business lead him to adopt certain sizes of windows and a particular thickness and description of sash. Although there is no such thing as the standardisation of windows, there are practically in the trade well known sizes and thicknesses. The contractor and the architect also of a row of houses or tenements avail themselves of the stock of machine-made joinery. In the design and construction of doors we observe the same reversion to a standard proportion and size. The profession as well as the joiner recognise such dimensions as 2ft. 8in. by 6ft. 8in., 3ft. by 7ft. and 3ft. 6in. by 7ft. 6in., and they also follow a method of proportioning the rails, stiles, and runtings of panel doors. These are proportions that look well and are convenient in the use of deal, also these minor proportions of framing have been dictated by the economical cutting of deals and battens. The architect does not always observe these detailed dimensions of parts, though he would be consulting economy of material were he to do so. But there are architectural rules for proportioning the width to height of doors and windows, such as those based on the works of ancient and Italian architects, and these constitute another and distinct standard that is followed in buildings of pretension. There are certain minimum dimensions governed by utility. Internal openings ought never to be less than 2ft. 9in., and their height ought not to be less than 6ft. 10in. or 7ft. to admit the tallest man to pass through, though the joiner's standard is a trifle less. For large buildings and state rooms, these sizes are inadequate and we find another æsthetic standard of proportion used, in which the width of openings are never less than 4ft., 5ft., or 6ft. A common and agreeable ratio of height to width for openings is 2 to 1, and this proportion has generally been followed by the great Italian masters, Vignola, Michael Angelo, Inigo Jones, and Chambers. The parts of the design of these examples, architrave, frieze, and cornice, are all according to some rule, the side architraves two-sixths of the opening, and the entablature about one-fourth the height of opening. These dimensions have been governed by æsthetic laws. Referring again to window openings, certain harmonic or arithmetical rules have been published; but they cannot, of course, be scrupulously followed.

Such are the rules given by Palladio and others. The law of lighting a room is not clearly defined; but it seems to us that it much depends on the height and position of the window openings, and the relation of those to the plan of the room, as to the area of the aperture. Some theorists think there is a direct relation between the area of

aperture and the quantity of cubic space in the room; but this would take no account of the depth of room from window end, nor the position of the aperture itself; for it is quite obvious that a given-sized window conformable to this rule would not light an oblong apartment so well as a square one of the same cubic contents, especially if the window were placed in the middle of the long side instead of at the end. Still, as we have hinted, there is an empirical rule that is followed by the architect. He knows by experience what size of window to adopt for a room of given dimensions. If one is too small, he puts another, or a third or more, so as to make the proportions of aperture agreeable for his elevation. One practical and useful rule that has been followed by some architects is that of taking the square root of the cube of the room to give the area of lights in feet; but this gives only the quantity of light which must be distributed by windows as most desirable. But the architect cannot be tied down to rules in his larger buildings; he is controlled by other considerations of an architectural character. It is otherwise in a block of tenements, or flats, where it is convenient and economical to adopt a standard window unit, not that any rule of proportion is followed in these cases, but, a certain size being determined, it is repeated.

The fireplace is another feature that has in the course of time assumed a definite form and size. The form and size of opening soon became fixed, and the internal decoration, jambs, and mantel naturally developed into the chimney-piece mason's stock pattern or convention, which the architect is seldom able to break through. Set forms are also seen in the details of our joinery and stone-work; but these are more or less architectural details. In the construction of load-bearing standard sections and sizes of timber joist; wood joists, rafters, quarters, trusses have certain scantlings, mainly derived from the conversion of planks, deals, and battens; these scantlings exercise some control over the architect's work. We referred the other day to the proposed standardisation of iron and steel sections, which illustrates in a remarkable manner the development of standard types in metal construction. From long experience in the use of girders and beams, the engineer and architect have found it advantageous to be able to specify sizes that are kept largely in stock for floors, bridges, roofs. The iron merchant's pattern-book has generally supplied the sections desired; but it would greatly aid the manufacturer and contractor if certain standard sections were rolled that could be used by the profession. The shipbuilder also, both here on the Continent and in America, has found the value of uniform sections adapted for several parts of his vessels. And the same process is at work in other branches of construction. In cheap stabling and farm buildings stock sizes for fittings are essential. In a few years we shall probably have other developments of the same principle: standards of tests of strength for floors and roofs, standards of seat accommodation for certain buildings, of size of rooms, like theatres, churches, and public halls, a standard proportion of exits to each 100 or 1,000 of an assemblage. There will also be standards of brickwork, of fire-resistance, and we are gradually approaching a more uniform method of ascertaining the amount of light and air necessary to our town buildings. There may, in fact, be standards of acoustical conditions as well as of construction. Building statutes and regulations have to a large extent resulted in forming such standards.

The question that concerns the architect most is how this uniformity of types and standards affects design. Have they hampered and restricted his resources and power as an artist, as some have considered probable? The fixing of certain sizes and proportions to

those features we have been considering is almost tantamount to adopting a scale. If openings like doors and windows are regulated in size, a certain uniformity of elevation must be produced in buildings of the same size and accommodation, though these dimensions would not be binding on other structures designed for other purposes, or of other size. These standards would not restrict the architect's invention in disposing the area, for instance, required for any given windows: thus, so many feet of light area could be placed in one square window or disposed in two or more; it would not restrict the shape; and the same argument applies to the area of rooms for general uses. In door openings, a standard proportion of aperture such as we now use does not restrict the architectural dressings or framing of the doorway. Indeed, it is hard to see how any standards of dimension or area could affect the design of the doorway. Architectural standards included set forms of architectural dressings, or that such things as windows and doors were all cast, as it were, to the same pattern for special purpose. Such would produce a stereotyped effect in our buildings. The fact is, the architect has plenty left him to play with—to exercise his invention on. He has varying purposes and magnitudes of building, plan, mode of distribution, detail, wall area, ornament, and other elements at his command. It is only when the same room or building is repeated in size that standard features would become monotonous by repetition. As to the smaller detail-like scannings and sections of a building—any standard would scarcely make an appreciable difference. Building progress assumes the survival of the fittest, a gradual approach to uniformity of type for particular purposes, and such tendencies are towards making each national architecture distinctive.

ROYAL ACADEMY PRIZE WORKS, 1901.

THERE were six competitors for the Royal Academy Gold Medal in Architecture, which was won, as the following prize list shows, by Mr. Bernard Hugh Webb, of Gray's Inn, the subject being a Town Hall for one of the new Borough Councils. The design is based upon an ingenious and architectural plan, with the assembly hall on the ground floor, having emergency exit doors on the rear side of the block into the back street, the site forming an island. There is in this scheme a good crush-room, well lighted from the domed ceiling, and cloak-rooms right and left or the use of ladies and gentlemen. The town hall has a rather flatly-treated segmental ceiling, divided into bays by coffered ribs rising over Ionic pilasters. The central arch, dividing the length of the apartment into two, somewhat unfortunately for an interpretation of perspective, has coupled pilasters, with a niche between enshrining seated figure. The pilaster at the gallery end broadens out into a nondescript pier, faced with a cartouche. The effect of the interior as a whole is plain, but hardly happy or artistic, lacking in novelty and scale. Over the main staircase the dome, which makes so conspicuous a feature externally, is treated within, irrespective of a cupola form, by a colonnaded lantern rising at the crossing of cruciform barrel vaults somewhat ingeniously, though objects might view the falsity of this kind of arrangement under a dome, but for the latter of that, this interior contrivance has the reference, if any, to what occurs above in the way of a roof. The dome really distorts for external effect only. The style adopted for the façade is a severe and not very interesting form of Classic, handled with breadth, obtained rather by the repetition of somewhat ordinary features than by any sort of masterly contrast between

voids and unoccupied walling. The dome has some degree of elegance, and bent clock-dials occur on the cardinal centres of the drum, assuming the curve on plan, so that the hands of the clocks would hardly work nicely, if at all. The composition of the cupola rises above the cornice masonry, with statuary at the corners. The drawings are indifferently good. The author of No. 197 will somewhat naturally feel that at any rate he might have been reckoned *proximo accessit*, for undoubtedly he has sent in a very capable and clever design, well worked out, and capably drawn from start to finish. We think his plan is not so good as the first, and having the town-hall on first floor renders it impossible to provide emergency doors direct into the street, as preferred, if not actually insisted on, by the London Building Act and County Council. His grand staircase ranges round a central hall, and a corridor above, architecturally treated, makes a striking feature in the general arrangement. The dome occurs over the council chamber; but internally the room is much too lofty for its size. The figure sculpture is well put in, and there are not a few clever parts in detail. The effect is rather full of lines—a result perhaps due to the heavy penwork employed by the draughtsman—and though the work is tasteful and good, it is not distinguished by any special degree of originality. The scheme figured 199 is the next design in merit, and this, too, has a good cupola; but the large-arched windows, as seen from the outside, look somewhat out of accord with the lintel style adopted, which is a severe mode of Classic. Internally, however, this fenestration harmonises somewhat better, and with the semicircular ceiling wall intersecting these over the windows, the result is pleasing, and would work out effectively. The other designs call for no particular comment with their towers and ordinary type of commonplace treatments.

The designs shown from the Academy Schools do not display a very high standard of merit, and we regret that the measured drawings of The Trinity House for which the Royal Academy silver medal in architecture was awarded do not compare in excellence with the draughtsmanship which marked the time when some of our contemporary leading architects were doing students' work of a similar character in the days of the Gothic Revival. The Architect's Competition in Perspective, won this year by Mr. A. Charles Bosson, is more spirited in style and finish than usual, and he has worked out the subject none the less carefully, though some of the foliated capitals are somewhat out of drawing. They are rather too full of lines to be effective. The subject is Lord Burlington's Villa at Chiswick. The point of view chosen is a little close to the object, and would be more suited to a gabled house than it is to a pedimented building of so severe a mode. "The Maske of Cupid," from Spencer's "Paerie Queene," forms the admirable subject for the decorative frieze of a public building. Mr. Frank S. Eastman wins the prize of £40 with a decidedly clever, if somewhat overcrowded, scheme, introducing all the figures of the text. The author's charcoal figure cartoon is admirably drawn and artistically finished. Mr. William Ewart Gladstone Solomon ranks as *proximo accessit* in the same competition, and we must admit that some will greatly prefer his broad and dignified handling, illustrated as it is by good colour and a handsome drawing, so managed as to be thoroughly decorative without too conventional a mannerism. Some of the designs submitted in this contest are exceedingly indifferent, and do not say much for the methods adopted in the schools wherein the students have been taught—we cannot say trained, if we judge by the productions.

ROYAL ACADEMY SCHOOLS.

The annual distribution of prizes to the students of the Royal Academy took place on Tuesday evening at Burlington House, when the President, Sir E. J. Poynter, was supported by most of the Academicians and Associates, and there was a large attendance of students and their friends. The competitive works were exhibited on Wednesday and yesterday in the Academy galleries, and are described above. The following is the full list of the prizes and prize-winners:—

Historical Painting (Saul and the Witch of Endor)—1st, Samuel Axcitt, 7-11;—Gold medal and travelling studentship (£200), George Murray; *proximo accessit*, Fred Appleyard.

Landscape Painting (One of the Bridges over the Thames in London).—Turner Gold Medal and Scholarship (£50), Osmond Pittman.

Landscape Painting (Cumulus Clouds over a Fen Country).—Creswick Prize (£30), Osmond Pittman.

Painting of a figure from the life (open to male students only).—Silver medal, 1st, Frank Samuel Eastman; 2nd, Jas. P. Sidney Streetfield.

Painting of a head from the life.—Silver medal, 1st, Gertrude Lullas; 2nd, Frederick Dullas Barnes.

Painting of a draped figure (open to female students only).—Silver medal, 1st, Lizzie Hinds; 2nd, Annie Margaret Page.

Cartoon of a draped figure (a Mourner).—Silver medal and prize (£25), Elsie Gregory.

Design in monochrome for a figure picture (The Sacrifice of Manahy). Judges' vote, 19-20.—Armitage Prizes—1st (£30) and bronze medal, Ernest Board; 2nd (£10), Alfred William Sangster.

Design for the decoration of a portion of a public building (the Maske of Cupid—Spencer's "Paerie Queene," Book III, Canto 12, v. to xvi.).—Prize (£10), Frank Samuel Eastman; *proximo accessit*, William Ewart Gladstone Solomon.

Set of six drawings of a figure from the life (open to male students only).—1st prize (£50) and silver medal, Walter Ernest Webster; 2nd (£25), William George Simmonds; 3rd (£15), Jas. P. Sidney Streetfield; 4th (£10), Frederick George Swaish. (Mr. Streetfield and Mr. Swaish were disqualified owing to having received a superior prize in the same competition before.)

Drawing of a head from the life.—Silver medal—1st, Walter Percy Day; 2nd, John Hodgson Lobley.

Drawing of a statue or group.—Silver medal—1st, John Hodgson Lobley; 2nd, Arthur Bentley Connor.

Perspective drawing in outline (open to painters and sculptors only).—The Entrance-hall of the Royal Academy.—Silver medal, Ada Gladys Fuller.

Composition in sculpture (Boadicea urging the Britons to avenge her outraged daughters).—Gold medal and travelling studentship (£200), Stanley Nicholson Babb.

Model of a design (The Expulsion of Adam and Eve from Paradise).—1st (£30), Frederic Charles Christfield; 2nd (£10), Frank Kansom.

Set of four models of the life (open to male students only).—1st (£50) and silver medal, Alexander James Leslie; 2nd (£20), Arthur Charles White.

Design for a medal (in Commemoration of the Death of Queen Victoria, with a head of the Queen on the obverse).—Silver medal, George Gilbert Walker.

Model of a bust from the life (open to female students only).—No competition.

Model of a statue or group.—Silver medal—1st, Louis Richard Garbe; 2nd, Elsieht C. P. Rommel.

Design in architecture (a town-hall for one of the new London borough councils).—Gold medal and travelling studentship (£200), Bernard Hugh Webb.

Set of Architectural Drawings (The Trinity House).—Silver Medal—1st, Charles Thomas Palmer; 2nd, Percy Ion Elton.

Set of Architectural Drawings (Upper School).—Prize (£25), Francis Winton Newman.

Set of Drawings of an Architectural Design (Lower School).—Prize (£10), Thomas Gerard Davidson.

Plan of a Building (a Casino and Pleasure Grounds on the borders of a Lake).—Prize (£10), Lionel Upington Grace.

Original Composition in Ornament.—No competition.

Perspective Drawing in outline (open to Architects only) (Lord Burlington's Villa at Chiswick, published in Kent. — Silver Medal, Alfred Charles Basson.

The Landseer Scholarships in Painting and Sculpture, of £10 a year each, tenable for two years, have been awarded—in Painting, to Frank Samuel Eastman, Alfred William Sangster, and Frederick Dallas Barnes (extra); in Sculpture, to Charles James Elworthy and Frank Ramsom.

After distributing the prizes the President remarked that in his last address he endeavoured to impress upon them that, although original genius was a gift granted to very few, it was within the power of all who had the artistic faculty to arrive at excellence—even at eminence—in their art by study and the determination "to neglect nothing." It was to be observed that Leonardo da Vinci when he would judge of the disposition of a young man for painting, said nothing about gifts or talents or original genius, but referred to a capacity for perseverance as affecting the best test, where for his work was truly the best equipment for an artist, far better than brilliant qualities, or what was called cleverness, a gift of no value in itself without the perseverance which would turn it to good account. Cleverness and technical facility were only useful as a means to an end; unless the result was worth aiming at, not only as a display of skill, but, the most contemptible power to which the artistic faculty could be put. The desire to be original was a constant besetment of the young artist, but unless founded on a solid base of knowledge and study it was apt to lead to mere eccentricity and to show a desire to astonish, rather than to command that legitimate admiration which is the best reward. There for his work was considered and thoughtful work and there was, perhaps, nothing more distressing to the intelligent observer of a work of art than an evidence of the desire to be original at all costs and where there was neither genius nor knowledge to support it. Novelty, in fact, was not necessarily originality; and respect for tradition was a far better groundwork for young artists than the cultivation of novelty of ideas or treatment, with the aim of showing his independence of tradition. Every artist, in so far as his individuality differed from that of every other, might be said to possess some degree of originality; it was only by assiduous study of nature, of course, under guidance, but more especially of the great works of past times, works which were stamped by the consensus of admiration of all thinking and studious minds, that it could be developed. Least of all could the artist be original by refusing to follow the traditions of the great masters. "Study nature assiduously," said Reynolds, "but always with those masters in your company," not as a guide, for a profound and artistic manner, but for study of their methods of seeing and rendering nature. "Art for art's sake," to use a cant phrase of to-day, had no meaning for them. That was not to say that the artists of old time did not take an exquisite pleasure in their work. It was not to be supposed that Raphael or Rembrandt did not consider their art sacred, when on whom they were their utmost powers to bring it to perfection, each according to his peculiar endowments; but that with them their art, consummate as it was, was always a means to an end—a vehicle for expression. With Raphael a divine sense of form clothed those ideas with a beauty inexpressible; Rembrandt, an immense mastery of technical skill was subordinate to a profound and poetic insight into the mysteries of nature and humanity. With neither was the display of the art which they had mastered an object in itself. He had made those few preliminary remarks, not because he thought that in the works which were exhibited in these rooms, and which were the result of their year's studies, there was to be noticed a prevalence of the faults against which he had been warning them, but because there could be no question that at the present time in the example set by many clever men, especially among the French, whose brilliant qualities were apt to lead too frequently to a desire for notoriety, novelty of invention as in themselves an aim, and superior to the sober study of art as means of expression. They were not their greatest men who did this; but the example was nevertheless dangerous, and the tendency was catching. There was nothing more

calculated to mislead the young artist than to be told that cleverness and originality were sufficient in themselves, that the methods of the great masters were "played out," and that to follow in their lines was academical and not worthy of the present genius. He had before combated the very prevalent idea that genius was dwarfed or fettered by the study of what was traditionally received as great; the idea was not new, and he did not know that he could say anything fresh upon it. What Reynolds had said was good for all time:—

"The more extensive your acquaintance is with the works of those who have excelled, the more extensive will be your powers of invention; and what may appear still more paradoxical, the more original will be your conceptions." The highly false idea that it was necessary to discard the old in order to produce something new took different forms at different periods, and what was now called in cant phrase and bad English "modernity," or "the modern note," was held to be a distinguishing feature of the original genius. There was no need, however, to affect any originality, if it was not in the things which they did; the spirit of the time could not but impress itself on the art of the day in some form or other, and it would show itself in spite of all efforts to hide it. Moreover, he failed to see that to adopt the pattern of design or colour, or the startling methods of execution of some eccentric painter in vogue, showed one who more originality in his manner than to follow in the footsteps of the great men of the past. Such aping of eccentricity might be good for the comic journals, but for serious art never. It was often not originality that the artist was deficient in, but the power of bringing it out, and that power: as Reynolds had said, was only to be acquired by the study of nature in company with good examples; when over they did; the spirit of the time could not but master the power of expressing their ideas, they would be able to devote themselves to the composition and treatment of a subject. If, then, they thought of the most forcible and vivid way of expressing it in conformity with what was most probable under the conditions given: if they contented to reach not only to the external originality, but to the internal, they would find it without their having to force it. Let them get at the heart of their theme, and they would find that they had been original without knowing it. After referring in some detail to the subjects of the more important competitions and to the work of the students in connection with them, the President said that he looked upon as unworthy of their imitation those productions of art which, in accordance with a prevalent fashion, depended on a display of technical skill and the rendering of "values," to use the phrase of the day, as the highest qualities which could occupy the painter. Those qualities were in themselves of minor importance, but the artist could do without them. They were the elementary necessities of his art, but they were nothing new in them. They were to be found in the works of all the great painters, and to make them the end and object of art was to invert the right order of things, to put the cart before the horse. It was indubitable that a brilliant display of technical powers and a great fascination to the eye if the artist had nothing better, he should display it, as the Dutch painters did, in the rendering of still life, not degrade to it the loftier themes in which human action and human passion and human portraiture came into play. There were painters, no doubt, whose qualities in that respect made us often forget their faults. Franz Hals, with his dashing, if vulgar, exception was one, but if they were tempted to rival his brilliant diversity in brush work they should remember that, like those great masters of the brush, Rembrandt, Vandyck, Velasquez, he too began with a careful and dry method of study, and that his amazing skill was only developed by degrees. He would warn them against certain schools of painting, which placed emphasis on the higher demands of the art. It was not that among the exponents of those schools there were not many gifted men, but that their example was dangerous to follow. When we saw beauty, character, form, design, invention, poetry, story, expression—he might almost say, judging from the examples which were exhibited—on the walls of foreign exhibitions, humanity itself—ignored in a work of art, and certain qualities of mere method existed; when the human form and face were made merely the vehicle for an exhibition of the artist's skill in

the lower forms of the art, accompanied, as it often was, by an apparently voluntary degradation of all that was noble in man and nature, we felt ourselves at a loss for any expression which would classify such work in the domain of art. To say that it was clever or displayed talent was not to the point. Talent in itself was nothing; it was the result—that sprang from the proper cultivation of it—that was of value. Surely the business of the artist was to seek for what was noble in humanity, to discover its character and beauty, and to render them with whatever of poetry was in his own nature, and with workmanship as perfect as his studies and practice could make it. When an artist painted a sandbank against a sky, the special qualities of light and tone and colour, the rendering of "values," in fact, were perhaps the only qualities we looked for; but when the human face and form were treated in the same way as a mere exercise for the painter's skill in tones, or, worse, as a mere copying of the squalid characteristics of some casual model posing as a goddess, or even, as he and some scientific Hibernian, exhibited the ignominious use to which they were put. Character, beauty, form, colour, expression, were what we desired first; the rest was to be used for arriving at these results. "These ought ye to have done, and not to have left the other undone."

THE PROPOSED NEW PREMISES FOR THE ARCHITECTURAL ASSOCIATION.

AN appeal for help towards providing a permanent home for the Architectural Association is being made to the profession and general public by Mr. W. Howard Seth-Smith, President, and Messrs. H. S. Ballou and Hugh P. Mayer, the hon. secretaries of the Association. They say:—The Architectural Association of London has for fifty-four years devoted its energies to the education of architects. It originated with a few enthusiastic students who combined for mutual assistance in their studies, and is now the principal architectural teaching body in the United Kingdom. The present membership is over 1,400, and includes most of the leading architects of the day. For forty years instruction in its classes was given voluntarily by its members; but the work during that period has so increased that in the year 1891 reorganisation became necessary, and the school was remodelled under a salaried staff. Its curriculum now embraces all branches of study essential to architectural practice. Last session 230 individual students attended the various classes and studios.

The subjects treated in the evening school of design are set and voluntarily criticised by well-known London architects, while the advisory council of the day-school includes almost all the architect members of all three societies of the United Kingdom. The schools have always been warmly supported by the Royal Institute of British Architects, and they prepare many men for the progressive examinations qualifying for membership of that body. This educational work has quite outgrown the premises in which it is being carried on, and the funds were voted of £10,000 for the purpose of its obtaining extended accommodation without delay. In the present overcrowded state of the classrooms and studios, the best work cannot be expected either of teacher or student. The space for library and offices is wholly inadequate, and the constant rearrangement needed to accommodate books, papers, drawings, &c., involves needless manual expenditure. Moreover, for many years past it has not been possible to hold any of our ordinary general meetings on the premises. The minimum accommodation required is as follows:—Two studios, with studio-libraries and store-rooms adjoining, three or four classrooms, a committee-room, instructors' room, large library, common room and mess-room, offices for the staff, a meeting hall to seat 300, a museum for models, specimens of stones, woods, &c.; workshops for demonstrations in the building crafts, caretaker's-rooms, cloakrooms, and lavatories.

The committee has for years devoted much time and thought to finding a site suitable for erecting a new building. The impossibility of ascertaining what site could be raised before it was necessary to close with others convinced the committee that there was no other course than to make an appeal for funds this autumn, and thus be prepared to take up the next suitable site.

According to the last two building schemes most carefully considered by the committee a sum of about £20,000 is needed to provide a strictly economical building, including equipment and fittings. As the Association is not able to afford out of yearly income more than a sum estimated to cover the ground-rent, rates, taxes, and repairs, it is clear that the whole cost of the new building and its equipment must be collected. The committee is encouraged, owing to the greatly increasing interest now taken in these subjects by the general public, to appeal to all those interested in architecture and technical education. Surely as no art tends more to mark the progress and greatness of a nation so no science does greater service towards securing the health and comfort of its people. The one great aim of the Architectural Association is that students may have the best means of qualifying themselves, both in the art and science of architecture. Cheques should be made payable to the Architectural Association, crossed "Capital and Counties Bank," and should be addressed to the Secretary, at 56, Great Marlborough-street, London, W.

THE SURVEYORS' INSTITUTION.

AT the ordinary general meeting of the society a paper was read on Monday evening last by Professor Somerville, of Cambridge University, on the subject of "The Valuation of Manure," as between the farmer and his outgoing tenants of farms. The total value of artificial manures imported was estimated as being some 5 millions per year, and, taking everything into consideration, the total manure bill of the British farmer could not be less than 11 millions annually. These figures showed the importance to the national interests of what might be called the imported fertility of the land. The author divided artificial manures broadly into nitrogenous and phosphatic, and gave many interesting details of the various chemical compositions which went to make either useful or less useful materials. The whole question revolved itself into one of the nature of the soil, and its power of absorbing and giving forth in useful form the nitrogen in the one case, and the phosphates in the other. There was no doubt whatever that a manurial element like nitrogen did influence the quality of crops; but there seemed no evidence to show that the different forms of nitrogen had different effects upon the composition of any particular plant species. The author thought that where crops had been sold off a holding, the outgoing tenant had no claim for compensation for the use of nitrogenous manure, except when the summer had been so dry as to make it impossible that the soil had absorbed the manure. In concluding a paper of the greatest interest to agriculturists, but too purely technical to interest our readers, the author laid down the proposition that the acquisition of a farm by a farmer ought to be regarded as the creation of opportunities for the profitable expenditure of capital, and that the measure of a farmer's success must largely depend upon the extent to which he availed himself of these opportunities. It could not be denied that the creation of increased fertility by artificial means gave an opportunity which in these days no farmer could afford to miss.

A discussion on the paper followed, in which Messrs. Langridge, Voelcker, Lloyd, Eve, Voss, and Dickson took part. The next meeting of the Institution was announced for January 13, 1902.

PAINTING PILLARS.

N what house agents call a "residential quarter" of London, says the London correspondent of the *Manchester Guardian*, I have lately noticed the prints of what I take to be a serious dispute. There is a row of houses of which the portals are held aloft by Ionic pillars. Each house has one Ionic pillar which belongs solely to it and one which is shared by it and the next house. Now, recently several houses in this row have been painted, and one of the Ionic pillars which are shared is apparently come under dispute. The front of one house, when I first noticed it, was being painted red; the front of the house next it was being painted white. On passing these houses the second time I noticed that the common Ionic pillar, which

the painters had reached by that time, had been painted white all over—that is to say, the owner of the white house had, in the cause of decency, painted white the half of the Ionic pillar which belonged to the red house. This might have been a matter of agreement, and so I supposed it to be. But the next time I passed by I found that the white pillar had now become wholly red. I admit that my curiosity was aroused, and I have walked that way again more than once on purpose to view the Ionic pillar. And I have been rewarded. To my surprise I discovered that the pillar had been painted half red and half white. The split in the colour is vertical, and the pillar now looks like the leg of a Shakespearean clown. I have hopes that it may yet be painted red above and white below, or red and white in patches. The moral, I suppose, is that it is a terrible thing to have an Ionic pillar in a villa.

ELECTRICAL INSTALLATION AND DECORATIVE WORK IN CONNECTION WITH EXPOSITION BUILDINGS.*

IN planning the electrical installation for an exposition, the first thing to be taken into consideration is the source of energy, and it must be decided whether it is to be from steam-plants on the grounds, or, as the Pan-American Exposition partly is, from a water-power plant and partly from steam-plants on the grounds. A large exposition requires an immense amount of energy, and the various ways in which it is called upon to give service raise the question whether or not it would be wisdom for such an exposition to depend entirely upon any outside source of power, or whether it is not preferable to make the electrical installation in an exposition calls for a number of classes of lighting service. First, there is the patrol lighting of the grounds, which is for the strictly utilitarian purpose of enabling employees and the public to see their way about the exposition grounds at such times and places as the illumination or display lighting is not available. Second, there is the general illumination of the grounds and buildings, which forms so important a part in all modern expositions, and, as press reports show, is by far the most important drawing feature of any of its attractions. Third, there is the display lighting, which may be considered as the most important, depending upon the skill with which the general scheme of illumination is carried out. In this class may be included fountain-lighting or other features of embellishment. Fourth, there is the lighting required in the interior of the buildings by exhibitors for general and special purposes. Fifth, there is the lighting of concessions—a point where an exceptional service is always demanded. In addition to these features, it is necessary to take into consideration the fact that an electric-power service has to be considered both for concessionaires and exhibitors. The Pan-American Exposition is evidence of the fact that the use of electricity in exposition work and attractions has developed surprising popularity, and it is reasonable to suppose that the probabilities are that each succeeding exposition will be more exacting in its demand upon electricity and the electrical department than the one before it. The great exposition of to-day calls for something besides splendour and high standards of general utility of the various services to which electricity has been applied is not forgotten. For this reason an exposition calls for complete police, fire-alarm, and signal systems, as well as the most perfect telephone and telegraph service: an ordinary exposition requires several hundred alarm bells. Work in all departments is greatly expedited by the telephone, and its early installation is a great aid to progress. The custom now is to place the mechanical and electrical work of an exposition service under one head in order that this department may be responsible for all the energy generated or distributed, the greater part being distributed by electricians. The electrical necessities have become so extended that the placing underground of conductors at expositions has become an established rule. To place such a mass of conductors overhead would obtrude on the main vistas to such an extent as to entirely spoil the architectural effect aimed at. Nature, the greater part of the electrical energy of the modern exposition is expended on lighting, and the major part of this is applied to the general and decorative illumination. In

arranging the illumination of an exposition, it is far easier to supply too much light than it is to properly diffuse the light at one's command. In other words, the engineer is more likely to err in providing too much light, than in not being able to supply enough. The illumination itself should never be the primary object, but should always be considered the means of obtaining artistic results. Judicious distribution of light is far more desirable than great brilliancy and glare. In fact, the latter effects are what ruin the beauty of any illumination. The effect of light, or what seems to be called "beautiful" has little or no use for an intensely brilliant light. It is generally recognised that the interpolation of a brilliant light between the object to be viewed and the spectator destroys the effect and injures the eyes of the spectators. In this paper I do not the intention of the writer to more than briefly outline the general principles underlying all truly successful decorative work accomplished by the aid of electricity with special reference to expositions, which at the present day offer the most extended fields for this class of work. Many creations of modern art have been the result of combinations, or modifications of something that has been handed down by the ancients. From generation to generation they have been passed until the originator is forgotten in history, and then the modern creation is passed off as something new. A busy world accepts the result and glories in the apparent progress of the art. However, when we enter the field of embellishment for night effects by the aid of the electric light, to the credit of the electrical fraternity be it truthfully said that we are dealing with a strictly modern affair and thoroughly modern creation. This is one of the few things admitted down the ages from the ancients. We build on modern thought, modern intellect, modern knowledge—not on the way-behind conditions of centuries ago. As one popular and learned writer, just before the opening of the Pan-American Exposition, put it, "A Greek or a Roman could no more have imagined the splendours of the nocturnal scene we shall behold at the Court of Fountains at Buffalo than a cave-dweller or a man of the Stone Age could have imagined the daytime aspect of Classic Athens or Imperial Rome." No matter what beauty the architecture may possess, the modern exhibition of the night scene are dependent on the skill of the expert in decorative illumination, and this expert must at the same time bear in mind the practical requirements of installation. It also seems needless to point out the fact that electric lighting has made possible effects undreamed of a few years ago, and that the installation and distribution at expositions calls for a kind of special knowledge only acquired by experience in this line of work. Unfortunately, it is the constant experience of those who have made a speciality of this subject that their part of an undertaking is considered of minor and secondary importance, something that may be supervised by non-specialists, by those having little or no knowledge of the fundamental principles of practical, decorative, and useful illumination. In planning the general illumination and display lighting, it is the province of the engineer and expert in this line to produce the most beautiful and practical effect, and to have the energy at his command, and here is where a thorough knowledge of the principles and long experience in similar work count. The incandescent lamp permits of a more artistic and enjoyable scene of illumination because of the freedom with which it may be placed in any position the designer may desire. In all artificial illumination it is essential to secure uniform diffusion of light if the best results are to be obtained. This can never be done by having the light concentrated in a few extremely brilliant centres about the space to be lighted. Such attempts to rival the effects of natural light, while the centres are brilliant enough, their very brilliancy makes the outlying space seem dark. No artificial method of illumination is perfect, and must be always open to some objections arising from many limitations. Very often it is necessary to place the light in the line of sight. This is a difficult effect to produce, and the expedient of subdividing the light into small units and distributing these units uniformly. A lamp of over 16c.p. or 20c.p. should never be used. What has just been said about diffusion and distribution of light holds true—not only in regard to illumination for useful purposes, but applies as well to decoration and embellishment.

* A PAPER BY LUTHER STARRINGER, A.I.E.E., read at the Thirty-fifth Annual Convention of the American Institute of Architects, held at Buffalo.

There is another method of obtaining the same effects—namely, by using high candle-power lamps and diffusing by means of globes, shades, and reflectors. This system, however, is seldom used. The expert in illumination has constantly to urge the fundamental fact that in artificial illumination we can secure but relative effects, the harmony of which will accomplish infinitely more than costly and laborious sensationalism. In the case of exposition buildings, the principle which experience has shown to give the best results is to outline and accentuate the lines of architecture with relatively small incandescent lamps. The night furnishes a background, and the imagination has free play to fill in the gaps. The effect produced in the illumination of an exposition is so largely a matter of artifice that the actual number of lamps used to accomplish certain results would be surprisingly small if known. The same amount of energy spent in illumination, if not skillfully distributed, might give very insignificant results, and when removed would leave no trace of its imperfections. Expositions are such a popular attraction, and of such general interest usually, especially in industrial fields, that they justify and demand illuminations that are exceptional and only fitted for just such occasions. An illumination such as might be presented at an exposition, if repeated night after night in a city for a period of several months, would be a popular attraction, and charged with having gone glory mad. The moral of this is that an exposition and its illumination cannot be judged as being in the category of one-night stand events, but should be looked upon as being thoroughly unique and of special requirements and character.

BRITISH AND IRISH BUILDING STONES. XXXIV.

RINCARDINE.

THE rocks in this county are Old Red Sandstone (122), Dalradian gneissose, and schistose rocks, Granite, Porphyrite. Inverberrie is built on a raised beach, Lower Old Red Conglomerate, and Porphyrite. Laurencekirk, Old Red Sandstone. Stonehaven: Old Red Conglomerate, raised beach, Alluvium, Mica Schist. The south-east of this county from above Stonehaven to the mouth of the North Esk, and inland to Gannoch Bridge (the latter line forming the base of a triangle, of which Stonehaven is the apex), is occupied by Old Red Sandstone, a narrow strip of Porphyrite running through it, almost parallel with the coast, from the North Esk to Upper Crigie. The north-west is occupied by granite, and everywhere between the granite and the Old Red Sandstone Dalradian rocks are found. Old Red Sandstone of the west division, consisting of red, chocolate-coloured, and porphyritic, Laurencekirk, and those of Forfarshire, is that found in this county. The Scotch Old Red is sometimes interbedded with enormous masses of contemporaneous volcanic rocks, and in this respect it is totally unlike the English and Welsh Old Red, amongst which no volcanic rocks have as yet been discovered. The same quartz quarries are Lauriston, Mr. W. Greig (13 men); Stonehaven, Mr. W. H. Mackay (three men); Three Wells Breich (six men); the trustees of the late ninth Lord Arbutnot; and Fordoun, Mr. Wm. Logie. The granite quarries are Craignair, Banerby (30 men), Sir Thos. Burnett; Hairness, Cove, The Hairness Quarry Co. (25 men); Cove, Messrs. J. McAdam and Sons (24 men); Baderby, Cruthen, Messrs. Stewart and Nichol (20 men); Leamochie, Dalrymple (Hill of Fare Granite Co. (21 men); and Stonehill, Nigg, Mr. J. Forbes (three men). Granite has been extensively quarried for building stone of the Dee, where it is a coarse grey crystalline rock, with the usual constituents, quartz, felspar, and mica. The grey granite was at one time largely exported to London for paving. The Lauriston and Woodston quarries furnish paving, the rubble and block stone. There are other sandstone quarries at White Craig and Red Craig. The Dalradian rocks between the river Dee and the granite are Gneiss and Gneissose flagstones; some of the granite they are quartzite and quartz schist, suitable only for rough walling.

ALAN CORRIE.

The rocks in this county are Permian Sandstone, Calcareous Cement Stone, Old Red Sandstone, and Silurian rock of Llandovery and Llandovery-ardoc ages, the latter being graptolite

litho shale, Granite, Quartz-felsite, and Porphyrite. Castle Douglas is built on Silurian rocks of Llandovery age and Alluvium; Creetown, Lower Silurian and Raised Beach; Kirkcubright, Raised Beach, Lower Silurian Shale; Maxwelltown, Permian Sandstone and Raised Beach. Practically the whole county is occupied by Silurian rocks, with great intrusive bosses of granite, which have been forced upwards through the sedimentary rocks, baking, and altering them. In fact, it looks as if the latter were at one time floating on a sea of molten granite! The Permian rocks occupy a very small area around Maxwelltown, and are portion of the mass around Dunfermline. Calcareous Sandstone of the east is a common Criffell along the Solway Firth; a small band is found on the coast between Port Mary and Kascarel Bay. Upper Old Red Sandstone is exposed along the western margins of the Calcareous Sandstone deposits already described. The newer sedimentary rocks are therefore found at Maxwelltown and along the Solway Firth, occupying the significant areas, as compared with the other strata; there are no quarries of any importance in them. Silurian rocks, which occupy the remainder of the county, where granite has not displaced them, are Shales, Sandstones, and Mafic Rocks worked in small quarries chiefly for rough walling and the coarser kind of dressings, such as quoins, sills, paving, &c. The most important in the granite masses which stand at Dalbeattie north of Creetown, Kells Range, and Cairnshire are Craignair, Dalbeattie, Messrs. Newall (177 men); Fell Hill, Creetown, The Scottish Granite Co., Ltd. (119 men); Kirkcubright, Creetown, The Moray Docks and Harbour Board (55 men); Caledonian, Dalbeattie, Mr. J. Ross (37 men); Cull, Creetown, Messrs. R. Thompson (30 men); Craignair, Dalbeattie (Nos. 1 and 2); Mr. D. Newall 34 men; Bagbie, Creetown, Messrs. Constable and Co. (25 men); Loch Hill, New Abbey, The Solway Granite Co. (24 men); Lotus, Killywhan, The Lotus Granite Co., Ltd. (31 men); Sterdstone, Dalbeattie, Mr. R. J. Walker (21 men); Craigduke, Newton Stewart North British Granite and Whinstone Co., Ltd. (20 men); Ashbank, Dalbeattie, The North British Granite and Whinstone Co., Ltd. (17 men); Craignair, Dalbeattie, Mr. R. Sowerby (11 men); and Barhill, Dalbeattie, The Dalbeattie Quarries Co., Ltd. (7 men).

LANARKSHIRE.

The rocks in this county are Coal Measures (352, 500, 363, 394), Millstone Grit, Carboniferous Limestone, Calcareous Sandstone, Old Red Sandstone, Silurian Rocks, Basalt, Granite, Diorite, Dolerite, Porphyrite. Carlisle is built on Carboniferous Limestone with Coal Seams, Millstone Grit. Glasgow, Carboniferous Limestone Series, Coal Measures, Alluvium, Basalt. Hamilton, Carboniferous Red Sandstone, Millstone Grit, and Basalt. Ayr, Carboniferous Limestone, Calcareous Sandstone, Strathairn, Porphyrite, Gray Rock, Carboniferous Limestone. By far the greatest area in this county is occupied by rocks which belong to one or other of the various divisions of the Carboniferous System as developed in Scotland. These are, in descending order, (1) Upper Red Sandstones, (2) Coal Measures, (3) Millstone Grit, (4) Carboniferous Limestone, and (5) Calcareous Sandstones. There are no workable coals in the Upper Red Sandstone, the chief coal seams in the Scottish coal fields being found in the Coal Measures (No. 2), and in the Central Division of the Carboniferous Limestone (No. 4). Thin limestone are found in the Millstone Grit Sandstone, Carboniferous Limestone, and Calcareous Sandstone, but the central division of the Carboniferous Limestone is remarkable for its sandstones, shales, coals, and ironstone, and the absence of any limestone whatever. All the Carboniferous rocks in this county have been invaded by igneous rocks, which are found in extensive sheets interbedded with them. The Old Red Sandstone, which covers the next largest area, is also invaded by the same igneous rocks, the basalt and other intrusive volcanic rocks. The Coal Measure Sandstones, which occupy the basin of the Clyde, are extensively worked for building. The principal quarries are Auchinlea, Cladding, Messrs. Taylor and King (104 men); Bothwell Park, Falside, The Bothwell Park Quarries, Ltd. (84 men); Auchinlea, North Cladding, Messrs. T. Gibb and Sons, Ltd. (70 men); Bell side, Cladding, Messrs. T. King and Co. (33 men); Falside, Uddington, Messrs. Miller Bros. (32 men); Greenhill, Cladding, Messrs. T. King and Co. (52 men); Bredisholm, Uddington, Messrs.

Purdie and Murray (22 men); Eastfield, Cambuslang, Messrs. Baird and Stevenson (20 men); North Kippa, New Monkland, Symington's Quarries, Ltd. (18 men); Falside, Bothwell, Messrs. Miller and Benwick (13 men); Earnock, Hamilton, Messrs. Brown and Henderson (12 men); Drumcull, Chryston, Messrs. W. Anderson and Co. (11 men); Greeniston, Glasgow, Mr. J. Dodds (11 men); Avenue Road, Calder, Messrs. J. Baird and Sons (10 men); Westfield, Rutherglen, Mr. J. Marshall (9 men); Holland Bush, Hamilton, Messrs. W. Brown and Sons (9 men); Gargard, Glasgow, Mr. J. Dodds (7 men); Windmill Hill, Motherwell, Mr. R. Park (7 men); Earnock, Hamilton, Messrs. R. Aitken and Co. (6 men); Hamilton, Messrs. J. Purdie and Co. (6 men); Wilsontown, Mr. W. Todd (6 men); Hartfield No. 2, High Blantyre, Messrs. E. Barlow and Co. (6 men); and Robroyston, Bishopbriggs. The Robroyston Quarry Co. not in work at present. There are mines at Huntershill, Bishopbriggs, and (11 men), Stonehouse, worked by Messrs. Baird and Stevenson, the former employing 140 men, and the latter 46 men. Carboniferous Limestone is mined for lime-burning in the following places:—Netherthorn, Auchinlea, Mr. J. Howie (48 men); Auldton, Lesmahagow, Messrs. W. and R. Wendell (25 men); Auchin, Lesmahagow, Mr. J. Williamson (19 men); Auchin, an open quarry at Brynmore, East Kilbride, worked by Mr. A. McVie (18 men), and at North Cobbinshaw, West Calder, Messrs. Baird Bros. (2 men). Old Red Sandstone is found along the east and south boundaries of the carboniferous rock, and surrounding outliers of the latter. The chief quarries in the Old Red rocks are Auchinlea, The Clydesdale Quarries, an open quarry at Brynmore, Larkhall, Mr. A. H. Boyle (50 men) Silurian rocks of Llandovery-ardoc Age are found in the extreme south-east of the county forming portion of the great zone which stretches across Scotland from Wigtonshire to Haddington, where they disappear under the Old Red Sandstone south-west of Dunbar. They are worked for road use only in rough walling. There are several whinstone quarries, the most important of which employ from twenty to thirty men. The mausoleum at Hamilton Palace was built with a grey Coal Measures Sandstone from Bramblinton, the palace itself was built in part with stone from Dalpatrick. Many country buildings were built with "Old Red Sandstone" from Huntershill, near Lanark, according to Hunt, but this is apparently an error, as Huntershill stone quarried north of Glasgow in rocks of the Coal Measures series. The Royal Bank at Lanark was built with Old Red from Threewood, and Lauriston Church with a yellow sandstone in the same formation quarried at Westfieldwood. Some of the Coal Measure Sandstones do not appear to be very reliable for building purposes. Mr. Hunt, an architect, in a paper read before the Edinburgh Geological Society on May 5, 1892, said of the stone quarried at Auchinlea, Cladding, "It is coarse and easily wrought; soft, and gets hard by exposure; considered a poor stone. The Calcareous Sandstone series, which yield the best building stones in the Carboniferous rocks, are apparently not so good as the latter, but this is because they are much altered by the invasion of igneous rocks. The Scotch quarry masters sell their stone by the cube, superficial, and lined foot. Some worked stones are sold at so much each, and rubble by the ton. In this county the Coal Measure sandstones are sold as follows:—(1) Cube stones up to 15ft., 15, 14d. to 1s. 6d. per cubic foot, and in thickness from 12in. to 14in. Six feet of 6in. shales 10d. per cubic foot, 35, 3d. per foot. The same sizes 12in. thick, cost 1s. 5d., and 1s. 8d. respectively. "Common Foundations" are also sold by the superficial foot if 12in. thick, and under at 6d. per foot. "Cope" is sold by the foot run in various thicknesses, from 6in. to 12in., the price varying from 1s. 10d. length and thickness 12in. by 6in. Cope stones 9d. per running foot, and 26in. by 6in., 2s. 3d. the same by 14in. costs 1s. 9d. and 4s. 7d. respectively. "Chimney Heads" 12in. high, are from 7d. to 6d. per lineal foot. "Common

Ashlar," 12in. high, 8jd. and 9jd. per lineal foot. "Natural Ashlar" is 1d. a foot dearer than Common Ashlar. "Common Coursers" are 5jd. per lineal foot. "Sawn Ashlar" (cut), 18jd. to 3jd., (natural) 11jd. to 5jd. per cut natural, machine-dressed, 14d. "Long Stones" are worked from 4ft. in length up to 12ft., the other dimensions rising from 12in. by 7in. to 24in. by 11in. The prices of Long stones vary in different quarries for the same scallings. The following are those generally quoted:—3ft. by 12in. by 7in. long, 12d.; 3ft. by 12in. by 7in., 25d. to 27s. 6d.; 4ft. by 24in. by 11in., 11s. 9d. to 12s. 11d.; 4ft. by 24in. by 11in., 90s. 6d. to 99s. 7d. each. "Columns" are worked in lengths from 9ft. to 9ft., and from 15in. by 15in. to 24in. by 24in. in width and depth. A column 6ft. long, 15in. by 15in., costs from 20s. 10d. to 25s. 11d.; the same 9ft. long costs 34s. 8d. A column 6ft. long, 24in. by 24in., costs from 70s. 4d. to 78s. 4d., and one 9ft. long, same scalling, from 115s. 6d. to 127s. 1d. "Wheeling Steps" are from 3ft. 6in. long to 7ft. 6in., and 7in. or 9in. thick. They are 6in. on the narrow end, and from 8in. to 32in. on the opposite end. A wheeling step 3ft. 6in. by 7in. by 6in.-18in. costs from 3s. 7d. to 3s. 11d., and one 7ft. 6in. long, other dimensions being the same, from 11s. 4d. to 12s. 6d. A wheeling step 7ft. 6in. by 9in. by 6in.-32in., costs from 22s. 3d. to 24s. 6d. "Scunions" are 18, 4d., and 24, 6d. "Rubble" is 1s. 7d. per cubic yd. or 2d. more. "Backs" are sometimes sold by the ton in lengths of 3ft. and under at 7s. 6d. Railway Shoddis at 6s., and Rubble at 2s. 6d. In Auchinlea Quarries sawn principal stones are charged extra, in addition to schedule prices for rough stone, not exceeding 7in. thick, 4d. per cubic yd. for narrow, and not exceeding 9in. 5d., and 1d. per foot super. more for every additional inch in thickness. Stones cut "natural" or "parapet" are charged 10 per cent. additional, and larger stones are charged in the same proportion.

PROTECTION OF MARSH LANDS.

PROTECTION of tidal rivers is one of the many things that every now and again force themselves upon the attention of local authorities, especially at this period of the year. The tidal rivers of this country often overflow banks and devastate hundreds of acres of valuable pastures, and flood the dwellings of the labouring classes in our great cities. We know by experience the damage to house and other properties caused by overflows of the Thames during extraordinary tides, and how helpless the authorities are to avert the damage till the flood has passed, when the inland water and rainfall tend to contend against. Our large rivers are sufficient to discharge the rainfall that finds its way into them. Great storm overflow-sewers have been constructed, as at Deptford; but even these are inadequate after a continuous and heavy rainfall of several hours' duration. In the East-end of London, the Thames has much need of the protection from tidal action, and it is of some value to consider the means that have been adopted for reclaiming the land by the building of banks to exclude the tide. Land so reclaimed has been often found to be most valuable on the farm, as several crops have been grown. Mr. E. C. Wilson, in a paper read lately on "The Practical Building of Lowland Protections," before the Civil Engineering Department of the University of Pennsylvania, dwelt on the subject of lowland protections. He describes the building of various kinds of bank, mud, revetments, stone, timber-work, bank raising, and ditch between fields, thus in one handling of the material the bank was formed. But the ditch, or "footing ditch," as it is called, was in time done away with. The dredging-machine is now used in forming the bank, the material being cast over behind the old bank raising, and the leveling is in degrees. Mr. Wilson describes the economical mode of operation: the bank is faced and levelled, the slopes are made 1 to 1 and 1 to 2 for the back; the top is of varying width and height. The

bank is then sown with grass seed, which prevents the mud from washing out, and forms a natural protection. Sometimes willow-trees are planted along foot of bank, their roots holding together the bank. Breaches are closed by sandbags, stone, sheet piling, &c., the two first methods being the most efficient systems of closing breaches. Double stone walls, with dredged materials deposited between them, is often adopted; but is often destroyed by the tide. Several forms of banks and breaches are illustrated showing the action of the banks and the failure of the sandbags, also represents the successive failures of a bank due to the wearing or erosive action of high tides. Musk-rat holes often loosen the material and aid the action of the tide. Referring to material for bank construction, the writer says good clean marsh mud is the best material, as it is easy to handle and packs well, and is less costly than clay which is used for puddling; but clay is often damaged by tides and rains; sand in bags is of use, but loose it is the worst material, as it washes away; gravel, when dry, is also a good material.

Hand-laid dry stone is recommended when the washing action of the waves or tide is considerable, and protection to the bank is required. This should be shaped and packed hand before the stone facing is put on, the stones being placed with their greatest width horizontally. When timber is abundant, crib formations make a good protection. Cord-wood perpendicular to the action of the waves is often used. Piles are about 10ft. in length and 1in. diameter, and laid within a few inches of top of bank, the ends being firmly driven into it. The sticks are piled in sections between vertical logs driven into the marsh between the sections, these keeping the horizontal logs in position. These timber protection have been known to last for thirty years in good condition. The author gives a plan and section of bulkhead protection. Piles are driven and flooring is spiked on to cap pieces on top of piles; but it is a more costly construction. The most effective and permanent protection is a concrete wall. The author gives details of the mode of construction, and of concrete and stone walls on foundations of piles, to which it is needless to refer here in any detail. The laying of the stone is very important; also the backing, to prevent displacement or movement from pressure of soil. Many necessary precautions are given in the paper. "We have many marsh areas that need protection from tide and wave action along our coasts, but the form of revetment depends largely on the local material; but between mud, timber or crib work, and stone, either loose or cemented, and concrete, the engineer has a choice of method. At the bends of rivers between flat and exposed marshes it is the best method to protect the tide and wave action in meadow, and by auxiliary banks. In small river bends or creeks different forms of bank protection are necessary. On the concave sides where the tide runs close under the bank a margin of marsh should be left, a dredged cut made, then a space of marsh, and next the bank. It is necessary, however, the margin of marsh should protect the bank from erosion at these turns. By means of widening the space between river and bank the bends of the river are protected where the action of tides is greatest.

Of course, one must go to Holland for lessons on the protection of marshes and low land. Fascines, or the protection of the bank by brush, is very generally used, and is effective. It is thus described: Reeds are laid horizontally along the bank to a thickness of 1in.; at right angles across these faggots are laid 5in. or 6in. in middle diameter, their thinner end pointing up the slope forming horizontal layers along the line of the bank, the ends of the faggots, or even layer overlapping the thin end of those in the layer below. Through these, at intervals of 14in., are driven stakes about 4ft. long, forming rows parallel to line of bank, and from 16in. to 2ft. apart. The heads of the stakes are left 8in. above the faggots, and are bound together with wattles, after the manner of hurdle work. When this wattling is complete, it is driven down with a mallet on to the fascines, and a peg or key is fixed through the head of every fourth stake to prevent the wattles from lifting. This protection is said to last from five to seven years, and will resist tidal action. A kind of straw thatching is also used as a protection of banks, or as it is called by the Dutch, "krammat." For stone defences the slopes can be made flatter and the banks higher than when wood protection is used.

Sir John Hawkshaw considered that the sand of a seashore with a slope of 6 or 7 to 1 proved an effectual barrier against waves if it was long enough. We knew at Folkestone the sand forms an admirable defence and resists heavy seas, and the same resistance of sea and sand has been found on the Norfolk coasts. It also makes a good hearing in banks with slopes, covered by a puddle of a foot or more thick, and pitching. Mr. Alexander Beesley's work on "The Reclamation of Land from Tidal Waters" is a useful work on the subject, of which we refer the reader to; but, of course, practical experience derived from actual examination of existing banks furnish the engineer with the most reliable data.

THE TOWERS OF CORNWALL.

UNDER the auspices of the local literary institution, Mr. E. Sedding, of Plymouth, delivered an interesting lecture in the Temperance Hall at Liskeard the other evening, Mr. A. C. L. Gubb presiding. The lecturer remarked that in many parts of Cornwall towers and churches seemed more to have grown by the work of nature than by the art of man. The first towers really consisted of a heap of stones, which were piled up, not for warlike purposes only, but to commemorate the death and also as the burial spot of some great chief either in war or as a ruling family. These were about 20ft. in diameter, and were built of rough stones and were two-thirds hollow. The lecturer referred to the recent discovery at Harlyn Bay, Padstow, where the remains of some person must have been placed 2,000 a.d., though, of course, in these matters, the date could only be guessed at. The Romans brought Christianity with them, and churches and towers were erected throughout the country, but none remained. When they left in 416 the Picts and Scots came and destroyed everything. The Scots came from Ireland (though it might seem Irish to say so). The British called in the aid of the Saxons, and gradually Christianity came back, and when 64,000 churches had been erected the Danes came and wrecked them right and left. It was no wonder, therefore, that no relics were left. It was a good thing that the Normans came: they were better masons, and at 1066 we had some of the splendid work at St. Germans, Bodmin, and Truro. The last of the Lostwicks, and Launceston were very fine Norman keeps. Mr. Sedding regretted that English people did not rightly value old buildings. He showed some beautiful illustrations of churches and towers in Cornwall, the first being that of St. Germans. The next was that of the fascinating little church and tower of Tintagel, the latter consisting of three stages, as was also that at Forrabury (Boscawen), and was undoubtedly Norman. The towers erected with buttresses were before the fifteenth century. St. Teath, near Delabole, possessed a window which was unusual. A good illustration of Tintagel tower was shown, this being one of the finest in the county, and had been described as the "glory of Cornwall." One side of Warbstow tower was covered with ivy, and presented a pretty picture. It was of the 14th-century date, as were also those of Michaelstow and Jacobstow. Morwenstow tower showed the finest Norman work in the long list of churches, which was built in a hollow, with the moor all around it. The tower at Egloskerry (near Launceston) had been spoilt by someone placing a window and doorway of the whitest possible granite in it. One of the most interesting in the county was that of St. Pomeis, which looked as if the architect had reached a certain height and then decided to expand the top. The smallest church and tower in Cornwall was at Tremaine. Illustrations of other towers and churches in the county were shown.

ARCHITECTURAL PHOTOGRAPHY FOR BEGINNERS.

THIS subject was exhaustively dealt with by Mr. C. H. Oakden, F.R.P.S., before the North-West London Photographic Society recently. The lecturer advised the use of the square bellows camera, as nearly all of the taper variety cut off part of the picture in wide-angle work. Lenses should be used of the long focal length, permissible for the subject being dealt with, and avoiding the employment of very wide-angle lenses unless absolutely necessary. As a general rule, mid-angle lenses would be those that came

into play most frequently. Lighting should be well studied, choosing the part of the day when the lighting was best. Mr. Oakden said he often had to wait for a long time for the "best" light, in fact, he had fixed up in a casual way, and was not waited for two hours for the most pleasing effect. The dealing with exposure for interiors was a difficult thing for a beginner, but he should always keep in mind the golden rule—i.e., "expose for the shadows and let the high lights take care of themselves." As a rough guide, most houses of our cathedrals, &c., require about one quarter of an hour at 72 using a Castle or Empress plate. Another very good guide was to use your subject, then stop down till you began to lose detail; with that stop give quarter of an hour with plates of the aforementioned speed. If it is necessary to use a much smaller stop, your calculations are very easily made upon this basis. The lecturer preferred potassium permanganate for development as being the most elastic, using 10 per cent. solutions. He advised taking 60 minims pyro, 60 minims ammonia, 20 minims bromide of ammonia, and making up to 1 oz. of water.

In conclusion, Mr. Oakden dealt with printing and illustrated his slides with a collection of prints and superb slides.

OIL FOR CLAY ROADS.

THE use of oil on clay, gravel, and macadam roads has been practised so often that it is no longer an engineering novelty, but an experiment in filling a bucket near Clarke's, Miss., as recorded by the *Engineering Record*, presents several new features. Buckshot is a tough black clay, and about as poor a road material again as can be imagined. The experiment was made under the direction of Major T. G. Dabney, chief engineer of the Yazoo Levee District, on 1,000 ft. of roadway, which was first reshaped with a road machine and then was thoroughly rolled with a five-ton roller. The road then received a sprinkling of water from a street sprinkler, with the idea of forming a coalescence of the small buckshot crumbles on the surface. After several days' exposure to the sun for drying the surface, a layer of coarse lake sand was spread on 100 ft. of the roadbed to a depth of about 1 in., and an application of finer sand was made upon an additional extent of 400 ft. to the same thickness. On the remainder of the road the buckshot surface was left naked.

When these preparations had been completed, at the evening the application of the petroleum was just begun, when a hard rain that night the next day caused a suspension of the application. Six days later the application of the oil was resumed. The surface of the roadbed had then become dry, but an inch and a half below the material was found to be gummy. This was not a favourable condition for applying the oil, but for fear that another rain would supervene and defeat the experiment for the present season, and having no means for storing the oil, it was determined to continue the operation of spreading the oil, which was completed in two days. It fortunately happened that for nineteen days preceding the date of the report no rain had fallen, and the weather had been almost continuous. The maximum daily temperature during this period ranged from 61° to 79°, while the minimum ranged from 53° to 58°. This favourable season operated to improve the condition of the road for the experiment over what might have been anticipated at the outset.

Five days after the last of the oil was spread the road was again rolled with the five-ton roller, which passed over it three times. This rolling was not deemed sufficient, but the team used was not available for a longer time. On the two following days a heavy rain fell, and the road was a half driven continually back and forth over the good surface, so as to pack thoroughly every part of it, after which the roller was again used on half a day to give a smooth surface, and then completed the operation.

The extent of roadbed covered with oil is about 1,400 feet, to which 100 ft. had a surface of sand, and 1,000 ft. of buckshot. The quantity of oil is believed to be in excess of what would be required under proper conditions and in season for its application. But having no means for storing it, and an old and rickety street car which carried the oil very uneasily,

it was necessary to put on an excess in order to get the entire surface covered. The width of the roadbed treated varied from 36 ft. to 50 ft., measured between the bottoms of side drains.

While no pains were spared to make the experiment as thorough as it was practicable to be made, yet the conditions were not satisfactory, and Major Dabney is not at all sanguine of the best results. The most unsatisfactory feature of the experiment is the lateness of the season in which it had to be made, which did not admit of the necessity to dry out the more fluid part of the oil and harden the surface of the road before exposure to traffic during wet weather. Another difficulty encountered, which was an incident of the lateness of the season and consequent shortness of the time available, was the lack of labour and time, and the poor device for spreading the oil on the road.

As regards the quantity of oil used, about one-half, or a little more, per square yard of surface covered would be sufficient if properly applied; and, furthermore, that about one-half the width of the roadbed treated would answer all the purposes of paving, except if the application of oil should prove a complete success.

The oil should be applied in the early summer, at the earliest period when the roadbed is found to be perfectly dry and hard. Then the oil should be evenly spread on a smooth, hard surface, and after some days' exposure to the sun should be rolled, after which one or more additional applications should be made in the same manner, the rolling being made very thorough. Indeed, during dry weather it is probable that the common traffic of the country would be an advantage to the roadbed.

With this constant packing and exposure to hot sunshine, the volatile parts of the oil would be extruded and evaporated, leaving only the gummy residue which, under pressure and mixed with the surface material, should form a tenacious asphalt-like cake as a covering and protection to the hard material underneath.

The expediency or otherwise of the application of sand to the buckshot surface will probably not be determined by this experiment, in the absence of the high temperature necessary to dry out the fluid part of the oil. The suggested necessity of strengthening the surface of the roadbed to prevent the oil from running, which was one of the functions of the sand to perform, was found in practice not to exist, as the oil was readily absorbed by the dry buckshot and did not run at all.

CHIPS.

Severage works are about to be carried out at Cherryington, near Cambridge, for the Chesterton Rural District Council. Messrs. Waters and Worrall, 2, Sidney-street, Cambridge, are the engineers.

Mr. J. E. Saeck, of Shrewsbury, a divisional surveyor for the county of Salop, has died the early age of thirty-two. He was the son of the borough surveyor for Welshpool.

The Corporation of Leicester have agreed to the text of the Parliamentary notice for the Tramways Bill. The Bill also includes powers for the manufacture and storage of gas in the Thurmaston-road, and the administration of Northern Nigeria. The Government have agreed to the Bill to borrow for tramways £650,000, and for gas purposes £300,000, £250,000 for the purpose of building new gasworks at Thurmaston South.

The Wington light railway was opened for traffic last week. Starting by a junction with the Wells branch of the Great Western system at Congresbury, it runs eastwards via Wington, Langford, and Barrington, to the terminus at Langdon.

Progress is being made with the railway from the Kaduna River to Wushishi, the new headquarters of the administration of Northern Nigeria, in spite of the difficulties inherent to its remote position, some 450 miles from the mouth of the Niger. The gauge is 2 ft. 6 in. Twelve miles of rails, steel sleepers, one locomotive, and six waggons, which were hired from the Admiralty, have been sent by Messrs. Sherriff and Son, the consulting engineers, were despatched by the Crown Agents for the Colonies and carried up the Niger and Kaduna Rivers. The rolling stock has been put together, five miles of the line have been laid and are in running order, and the large store shed, a cement shed, workshops, quarters for the natives, and houses for Europeans have been erected within 107 days of the authorisation by the Colonial Office.

BOOKS RECEIVED.

Painters' Colours, Oils, and Varnishes, By GEORGE H. HULST, F.R.S., &c. Third edition, revised and enlarged, with numerous illustrations. (London: Chas. Griffin & Co., Ltd., Exeter-street, Strand).—This useful, practical manual for painters and others has been much enlarged, and the information given on the theory of colour, the spectrum, the manufacture and preparation of pigments, of varnishes, &c., will be found of much value to all students of the painter's craft, and to the trade generally. The style is direct, and the author enters into painting as a decorative art, but simply deals in a comprehensive and practical manner with the manufacture of pigments, their properties, and composition. White pigments are dealt with at some length, and a description of the more important are given—namely, white lead, lead sulphate, zinc white, zinc sulphide, barytes, gypsum, calcium carbonate, and china clay. The manufacture of white lead is treated very fully. The stack method, chamber method, precipitation processes, &c., are explained and illustrated; the old Dutch, or stack, process retains its pre-eminence as the best process. The wet precipitation processes, when the lead is used in the form of a solution and the precipitant is effected by means of a current of carbonic acid gas, are many, and are described. Zinc white is another largely-used white. It is costly, and is often adulterated with other white pigments, such as china clay, barytes, whiting, &c. We are told it should be "completely soluble in dilute sulphuric acid without efflorescence—a property possessed by other white pigments." The efflorescence indicates an addition of white lead, whiting, or magnesia. Most other adulterants are left as an insoluble residue. The solution in acids is quite colourless." Zinc white is an oxide of the metal zinc having the formula ZnO. It is prepared by combustion of metallic zinc also by the action of heat on certain zinc compounds. The first method is the one generally used. The essay and analysis of pigments, and the processes used, colour and paint machinery, grinding and mixing mills, drying stoves, levigating plants, &c., are illustrated by numerous cuts, and the processes of levigation, drying, preparing colour by precipitation, filtering, grinding, and mixing are described. The chapters on paint, whiting, &c., and on varnishes, such as oil, &c., and on varnishes are useful. There is a good index. All workers in colours and painters, &c., will find Mr. Hulst's volume a useful summary of the chemical properties, analyses, &c., and mechanical processes used in the manufacture of pigments and varnishes. —*Sanitary Fittings and Plumbing*, by G. LESTER SCRIFTER, A.R.I.B.S., M.S.C. &c. London: Whitaker and Co., Paternoster-square.—This is one of the *Bulb's Students'* series of handbooks, already mentioned by us, and is well illustrated. The book is a reprint of a series of articles that have appeared in our contemporary, but new matter has been added. Mr. Scriffter has endeavoured to bring together in a compact little volume the principles of sanitation and the fittings and details required by the modern architect. The principles that should control design of fittings are stated, and one chapter gives plans of sanitary rooms, the planning of hospital wards, bathrooms, &c.; also isolating lobbies, verandahs, nurses' rooms and isolation wards, lavatories and bedrooms, fire-works and labourers' cottages, and underground conveniences, &c., which will be found useful. The other chapters deal with the various fittings and fixtures of houses, waste-pipes, ventilation, and the appendix contains the by-laws of the L.C.C. recently issued. The illustrations are numerous and well drawn. —*Workshop Wrinkles for Decorators*, By A. D. FORDRINGER, Editor of *The Architect*, London: W. & A. Greenwood, & Co., Ludgate-hill.—This little book is intended to meet the requirements of those who have no time for diligent research or study. The recipes or "wrinkles" are arranged alphabetically under each of the trades of Decorating, Painting, Paperhanging, and Miscellaneous. Decorators, painters, and amateurs will find it a handy reference work of enormous use on nearly every subject they are in need of, from the preparation of whitewash to the decoration of a room. The price of the book is 2s. 6d. net.

It has been resolved to engage an expert to advise on the reconstruction and rebuilding of Exe Bridge, Exeter.

Building Intelligence.

BLACKPOOL.—The decoration of the Blackpool Council Chamber has now been completed. The treatment is English Renaissance. The ceiling with its fine rove is decorated in a boldly-modelled plaster, and has been subjected to a very simple color treatment, so as not to compete with the rich decorations below. The walls are framed in with a high dado and pilasters in oak left unpainted in its natural colour. The wall surfaces left uncovered by the oak have been formed into five panels, two of which are treated with conventional ornament and armorial bearings, while the remaining three spaces have been filled with fine pictures illustrating episodes in Lancashire history. Over the mayor's chair a large picture typifies the reconciliation of the Yorkists and Lancastrians, representing, as it does, the marriage of King Henry VII. of the House of Lancaster to Princess Elizabeth of the House of York. The wedding was solemnized in Westminster Abbey in January, 1486, and rivalled the coronation ceremony, which it followed, in splendour. The second picture, over the Press and public platform, represents an event perhaps more closely connected with the Fylde district than is concerned in the others—the Surrender of the Rebels at Foulton in 1470. The third picture, to the right of the mayor's chair, depicts the last desperate charge of Richard III. The internal fittings are all in oak, and are rich and imposing in character. The arrangement gives a raised platform and desks for the mayor, deputy-mayor, and town clerk, at the north end. The aldermen and councillors' desks and seats are arranged in horseshoe form in order that each member shall face the mayor. The pictures were painted by Mr. J. Brown, the superintendent of the Art Department of Messrs. Goodall, Lamb, and Highway, Ltd., who carried out the work under the superintendence of Messrs. Potts, Son, and Herrings, the architects of the building.

BIRMINGHAM.—The new board-room of the board of guardians at St. Peter's Hospital was opened by the Right Hon. Walter Long, M.P., on the 5th inst. In course of last year it was decided to erect new buildings at the west-end portion of St. Peter's, without interfering with the ancient fabric of the hospital. The architect is Mr. W. S. Skinner, of Edinburgh Chambers, London, and Bristol. The new accommodation on the three floors is as follows:—First floor: board-room, 40ft. by 30ft., with entrance lobby and long corridor down stairs; guardians' private room, 21ft. by 11ft. 3in.; and chairman's room, ladies' cloakroom, and small office. Ground floor: entrance level, two small offices, ladies' lounge, 29ft. by 21ft. 6in. Basement (gray level): pay station, 49ft. 6in. by 21ft. 6in., with two offices for relieving officers, 17ft. 6in. by 11ft. 9in. each, and lavatories and stairs to ground floor. Messrs. Stephens, Bastow, and Co., Ltd., of Bath Buildings, Bristol, took the contract for the work valued at £35,196, and with additional £10,000 for structural alterations has been about £5,500. The new board-room is lined throughout to a height of 15ft. in panelled and pilastered Austrian oak, designed in the Jacobean style, but of a somewhat later date than the woodwork of the old board-room. The ceiling and pilasters are carved, and no two panels of the former are of the same design. The ceiling is coiled, ribbed, panelled, and enriched in plaster, and has a central lantern light, 21ft. 6in. by 11ft. 6in., the opening being surrounded with an enriched plaster frieze, &c. Electric light is given from six electroliers, each of five lights, and from a central one, with dog grate, specially-designed light, and vent. The mantelpiece is constructed with Norwegian green marble surround and curve, and has an Austrian oak mantel and overmantel. The seating accommodation is for 64 persons, in addition to seats on the dais. The whole is of Austrian oak, upholstered in green mohair. Each of the ordinary seats has a flap desk with accommodation for writing materials.

DUNDEE.—The building trade in Dundee during the past year has, says the *Scotsman*, been very dull—indeed, one of the duller for quite a number of years; and the prospects for the coming year are not very bright. Full employment has not been afforded to any class of tradesmen, and quite a number of workmen have had to leave for other centres in search of work. With the exception of the masons, who had their wages

reduced by 3d. per hour, no change has been made in the rates of pay. No buildings of any importance have been added to the architecture of the city, those erected being chiefly tenements of dwelling-houses and small villas. Feuing has taken place, chiefly in the northern and eastern districts of the city, although the western and Loches sections have received a fair share of the building. The bulk of the buildings in the northern district consist of tenements of dwelling-houses; but in the Maryfield district the greater portion of the houses are small villas. The supply of houses is much greater than the demand, and, although the western portion is overbuilt—at least, for the present. There are, 1,931 empty houses, representing an annual rental of £14,366.

GATEHEAD.—The foundation-stone of the new Sunday-schools and parish-hall in connection with St. John's Church, Gatehead Fell, was laid last week by the Bishop of Durham. The building is to be two stories in height, and consist of two large halls and two classrooms. The accommodation of each of the large halls for adults will be 270 for meetings, and 200 for services, and 300 for children, and the classrooms each 50 for adults and 50 for children. The materials of the building are stone walls with slated roof, and the timbering will be of a strong character. The elevations will be treated in coarse rubble for the ground floor, and rough-cast and half-timbering with overhanging roofs for the upper floor. The building will be heated with hot-water pipes and radiators from a heating cellar, and the ventilation will be by means of vertical air-bricks, the latter being connected with a ventilating tower above the roof. The contractors are Messrs. Morrison and McBean, of Gateshead, and the architect is Mr. James W. Frazer, A.R.I.B.A., of Newcastle.

HACKNEY, N.—The new Empire Theatre in Mare-street and the Grove, built from designs by Mr. Frank Matcham, was opened on Monday night last. The main facade is carried out in the Victorian design. The central portion contains the entrances to the stalls and grand circle, and over this is an open balcony with an arch over, springing from columns, and surmounted by a pediment with a figure holding aloft an arc light. This elevation is flanked by towers, crowned by battlements, and surmounted by a pediment. In the centre of the frontage is a grille of wrought iron containing the word "Empire," which is lighted at night by electricity. The elevation towards the Grove is less elaborate. The doorways in the ground story of the front towers form the entrance to the pit-stalls and the exits from the stalls. In the centre, polished mahogany screens with swing-doors open into a lobby, and thence to the grand vestibule. This has a panelled ceiling and frieze, in which lunette windows are introduced and corresponding panels containing painted designs. The floor is laid with vitreous mosaics, and the walls are embellished by polished alabaster pilasters and dados. The staircase is a double one in white marble, and is flanked with alabaster balustrades with coloured cappings. The first flights of this double staircase meet on the landing overlooking the vestibule, and it is continued up through small openings. The ceilings being introduced into small cells, and studded with small electric lamps. Under the crush-room and between the stalls and pit-stall entrances is the smoking saloon. The decorations in the front portion of the theatre have been carried out by J. M. Beck-binder in Flemish Renaissance from the architect's designs, the colouring being in delicate tints, relieved with gold. On the walls panels are framed, containing paintings representing *Eloquence*, *Grace*, *Tragedy*, *Comedy*, and *Music*, the whole forming an elegant auditorium. The pit, gallery, and balcony are approached through wide fireproof entrances and staircases from the street. The auditorium is one of the largest in the Metropolis, measuring 76ft. from curtain line to the back wall of the pit, the width across the back of the pit being nearly 80ft. The ground floor is apportioned to fauteuils, stalls, and pit, the two former being fitted with tip-up seats, and the latter with continuous upholstered seating. The seats are covered with thick velvet, and have cork and cork carpets. The grand circle is fitted with wide curved rows of tip-up seating, and only seven rows are required to seat 300 people. The entilever principle having been adopted, no columns intervene between the audience and the stage. Over the grand circle is the balcony, containing seven rows of tip-up seats. The seats are continued round to the private boxes on each

side. The gallery comes over the balcony, so that the house has three tiers. The top gallery, however, is not continued round the sides, but is stopped with a curve running into one of a series of side columns, from which spring three arches, the central arch being a very large one. From the key of this arch is suspended an electrolier. The main ceiling is a rectangular, having a central sliding roof in the centre, and two panels each side, filled with allegorical paintings. The decorations of the auditorium have been carried out by Messrs. De Jong and Co. The auditorium and entrances are built of concrete, iron, brick, and stone. Briggs's alarum bells are fitted to all doors. An asbestos fireproof curtain separates the auditorium from the stage. The latter is 60ft. wide and over 10ft. deep, and all illuminating power is electric. The dressing-rooms are contained in a separate block, are lighted by electricity, and warmed by hot water.

HOLLYMOOR, BIRMINGHAM.—The report of the Lunatic Asylums Committee of Visitors, to be presented to the Birmingham City Council in January, has been a considerable progress has been made with the new asylum at Hollymoor. The boiler-house, engine-house, and water-tower walls have been erected to a height of about 7ft. above the ground, the chimney stack to about 33ft., the bakehouse to about 3ft., and the male and female attendants' homes to about 8ft. above ground. The greater of the basement block, from the boiler-house to the front corridor, has been completed. As regards the kitchen patients' block, the foundations are in to the ground line; while in the male working patients' block the excavations are nearly completed. The isolation hospital is to be a detached building, and a portion of the roofs being boarded and felted ready for slating. This portion of the work has been proceeded with as rapidly as possible, in order that accommodation may be provided for patients from Rubery Asylum in case of an outbreak of infectious disease. The eight sub-tenants' cottages, four have been erected in complete, and in the remaining four the roof timbers are fixed ready for slating. Up to November 22 last 2,026,000 bricks had been made upon the ground for use in the building. Messrs. John Bowen and Sons, of Birmingham, are the contractors, the amount of the tender submitted in April last year having been about £240,000.

HEXHAM ABBEY.—The Bishop of Newcastle, writing in his *Diocesan Gazette*, says:—"There has been a necessary pause for some time in carrying out the great scheme for Hexham Abbey. The opinion of counsel was taken as to the liability for estate duty of the two large sums given by the late Mr. Thomas Spencer within the year of his death, and the sum of £10,000 for endowing a canonry. Upon the opinion being unfavourable to exemption, the heirs, with great liberality, authorised the administrator to pay the entire duty (at 7½ per cent.) out of the estate, so that both sums are intact. This question having been settled, there has been a considerable delay in the completion of the Hexham Committee and the trustees of the late Mr. Thomas Spencer's gift, which has led to an agreement, into which the architect employed by the Hexham Committee (Mr. Thomas Moore) has willingly entered, to refer to three of the most eminent architects of the day questions which have arisen with reference to the plan of rebuilding the nave and to details of the plan. There is every prospect of these difficult questions being settled in the winter months, and I have every reason to believe that what will eventually be carried out will represent the best expert opinion of our time."

LEEDS.—A new Hospital for Women and Children is in the course of erection from designs by Messrs. Chorley, Connon, and Chorley, of Leeds, with Mr. A. Graham, F.R.S., of Regent-street, W., as consulting architect. The building will be divided into three departments—the out-patients' block, the hospital block, and the administrative block. The out-patients' department is planned on a completely new floor plan, and will be quite independent of the hospital proper. The communication will be for the convenience of the staff only. The accommodation here comprises an out-patients' hall, shelter for perambulators, rooms for consulting, examinations, registrations, the dispensing of medicines, and other purposes of a purely professional character. The basement will be used for storage purposes, and on the ground floor there will be

The Sun Insurance office daintily-produced desk almanacs and blotters are always in request, their artistic production being much above the average. One excellently-printed pocket-card, bearing a coloured rendering of Mr. Stanhope Forbes's picture in the Royal Exchange of the Great Fire of London, deserves special mention.

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ILLUSTRATIONS.

LONDON AND COUNTY BANK, EPSOM.—HOUSE AT FISHER.—GREYFRIARS CHURCH, ABERDEEN.—HOUSE AT LIMPFIELD.—PLAS NANT-Y-GLYN, COLWYN BAY.—QUEEN VICTORIA MEMORIAL DESIGNS.—PRESBYTERIAN CHURCH, DORSET, ENGLAND.—GEOFFREY'S STUDY, MONMOUTH.—TYPICAL LATE EIGHTEENTH CENTURY CHAIRS.

Our Illustrations.

LONDON AND COUNTY BANK, EPSOM.

These new premises have been erected in the High-street, Epsom, from the designs of Mr. W. Campbell Jones, A.R.I.B.A., architect.

HOUSE AT HASTE BELL, FISHER.

This house, for Mr. J. R. Cooper, J.P., is being built. The materials used for the exterior of this house are stone, rough-cast, and red tiles. The garden to be treated as a formal Dutch garden. The tender for this house was obtained from Mr. Geo. Grey, builder, High-street, Egham, and the quantity surveyor is Mr. Geo. Webster, Westminster, the architects being Messrs. Hall, Cooper, and Davis, of Old Queen-street, Westminster, and Scarborough.

GREYFRIARS CHURCH, ABERDEEN.

The West Tower shown in our illustration is from the designs of Mr. A. Marshall Mackenzie, A.R.S.A., F.R.I.B.A., architect.

HOUSE AT LIMPFIELD, SURREY.

This house has lately been erected from designs by Messrs. Harrison and Ward, of Victoria-street, S.W., upon a site of five acres adjoining Hookwood Park. It is a rough-cast building relieved by bright red-tiled roof and red brick plinth, and the window openings are filled with lead lights in iron casements. Internally the ceilings of reception-rooms, &c., show large oak beams and oak joists, and the principal staircase and doors to ground floor are also of oak. The whole of the furniture is of antique brass and wrought iron throughout, and was specially designed for the building. The work has been carried out by Mr. J. Brasier, builder, of Limpfield. The drawing here reproduced was shown at the Royal Academy this year.

"PLAS NANT-Y-GLYN," COLWYN BAY, NORTH WALES.

Our view represents some recent alterations and additions which have been made to existing premises, from plans prepared by Messrs. Booth, Chadwick, and Porter, architects, of Manchester and Colwyn Bay. The centre block with turret is new, and is designed to fill up a gap which seemed to sever one portion of the house from the other; the wing on the left is also new, and adds very much to the general effect of this elevation. The site is an exceptionally fine one, overlooking the famous Nant-y-glyn valley.

VICTORIA MEMORIAL, ST. JAMES'S PARK.

The entrance from Trafalgar-square formed one of the essential, as indeed the most difficult, features of the problem associated with the new Royal Processional-road, and in times past we

have illustrated other projected schemes in connection with the improvement of the Mall. Sir Thomas Drew, P.R.A., distinguished his share in the recent competition for the Queen Victoria Memorial by boldly endeavouring to embody in his design a suitable connection with the top of Whitehall and Trafalgar-square with the Royal entrance to the park. In this he was no doubt unduly hampered by the style of Drummond's in the centre of the most commonplace of modern London buildings. We reproduce Sir Thomas Drew's drawing, showing the large blocks of offices with which he proposed to flank his Royal Gateway, which at any rate has the advantage of being actually an entrance through which the traffic must pass, and not an isolated structure in the middle of a *grand place* only to be used occasionally. Our previous illustration of this proposal appeared in the BUILDING NEWS for November 8 last.—The Queen's Garden fronting Buckingham Palace formed, as our readers are aware, a most conspicuous part of the schemes submitted by all the competitors, and in the centre of the *grand place* so formed the monument of the late Queen is to stand. Mr. Ernest George brought his plan forward in the form of an elongated inclosure, differing materially in this respect from all the others, though his terminating colonnade was in some ways similar to Mr. Aston Webb's chosen design. Our bird's-eye view of Mr. George's general scheme in the BUILDING NEWS for Nov. 15, and his Royal gateway appeared in the following issue. To-day we reproduce the perspective which the architect made looking from the Park as viewed from the Lake in St. James's Park, Buckingham Palace being to the left hand of the picture. The colonnade ending the "garden," if shown, would appear some distance from the front of the monument on the right, as a reference to the bird's-eye view will show.

NEW PRESBYTERIAN CHURCH OF ENGLAND, HOATH PARK, CARDIFF.

These buildings have been erected from designs prepared by Messrs. Habershon, Fawcner, and Groves, of Cardiff and Newport, at a cost of £11,000. The schools (costing £1,800 of this amount) were built by Messrs. Know and Wells, and the church by Mr. Allen. A pressure-water is adopted for warming, and electric for lighting. The buildings are faced with blue Pennant stone, the firestone being Monk's Park from the Bath Stone Firm's quarries. The organ, which when complete will have cost about £1,100, by Messrs. Harrison and Harrison, of Durham, and is blown by water-power. The church will accommodate 850.

GEOFFREY'S STUDY, MONMOUTH.

MONMOUTH is a quaint old town, with a handsome church tower and spire to the left of the entrance of the main thoroughfare, which makes a striking composition when seen for the first time. The front of the building is a Tudor oriel, forming part of the ancient priory, and this fragment goes by the name of Geoffrey of Monmouth's study, the subject of the pen-and-ink sketch herewith reproduced. The Market-place has a statue of Henry V. in front of the town hall. The Market stands on the edge of the cliff overlooking the Monnow.

TYPICAL CHAIRS: LATTER PART OF THE EIGHTEENTH CENTURY.

These four examples are all in the National Museum at Kensington, and belong to the Hon. W. F. Massey Mainwaring, M.P., and all of them belong to the same period, though they differ very characteristically in the details of their design. Thus differing, they harmonise with each other, and mark the production of a distinct school of design which has during the last decade found many imitators. As typical specimens, these chairs undoubtedly are most interesting; they are comfortable, and suitable for modern use. It is all a question of taste as to whether they are admired or not. At any rate, they are graceful in outline and strong in their make, without looking like spindle-work on the one hand or assuming an uncouth extravagance of scale on the other, like some of the Arts and Crafts novelties, which are supposed to be so very *chic* and up-to-date in some quarters.

COMPETITIONS.

CAMBERWELL.—Fifty-two designs were sent in for the baths and washhouses to be built in the Old Kent-road by the Borough Council of Camberwell. Mr. A. Saxon Snell acted as assessor, on the nomination of the Council of the Institute, and on Wednesday his award was confirmed as follows:—First premium, Mr. E. Harding Payne, A.R.I.B.A., Bedford-row; second premium, Mr. S. B. Russell, F.R.I.B.A., London, and Mr. C. E. Mullows, F.R.I.B.A., Bedford; third premium, Mr. H. Ashton Peardon, A.R.I.B.A., Chancery-lane. All three had been in view till Wednesday evening next, at the Camberwell Public Baths, Church-street, Camberwell Green, S.E. We understand that several of the leading specialists in bath-building are numbered among the rejected competitors, and that the designs submitted are, on the whole, of an exceptionally high standard of excellence, but we have not yet seen them. The site was a very difficult one to deal with, and the requirements were of a highly complex character. £50,000 was the limit of the amount available. The institution will comprise two swimming baths, 130 warm baths, a Turkish bath, and a public washhouse with fifty compartments.

CHARDERTON.—The decision is announced in the Stanley-road Schools Competition. The assessor was Mr. A. N. Bromley, Prudential Chambers, Nottingham. The result is:—1. Mr. C. T. Taylor, A.R.I.B.A., 18, Clegg-street, Oldham; 2. Messrs. Winder and Taylor, Union-street, Oldham; 3. Mr. Richard Holt, Dale-street, Liverpool; 4. Messrs. A. Saxon Snell and J. D. and H. Aspinall, 24, Richmond-terrace, Blackburn.

CHIPS.

At the last meeting of the school board for Southampton it was decided to vary the remuneration to their architect from the present commission of 5 per cent. on the entire outlay for the work to a fixed rate of 4 per cent. on the actual expenditure afforded, reckoned as costing £12 per head.

Mr. H. Percy Bonhoiss, an inspector from the Local Government Board, held a public inquiry at the town hall, Birtown-in-Furness, on Friday in respect to the town council's application to borrow £8,125 for the purpose of erecting a new pier, &c., for the improvement of Walney Promenade, and £1,500 for a new fish market.

The governors of the Upper Lytner School, King-street, Hammersmith, celebrated last week the completion of the additional buildings at the school. The extensions include a physical laboratory, a chemical laboratory, and a balance-room. On the opposite side of the corridor are five classrooms and a physics room. A separate block of buildings includes a gymnasium, a woodwork room, a tack-shop, and a lace store room. The extensions have cost £14,000, the total cost of the school being about £30,000. The buildings have been designed by Mr. G. Saunders, F.R.I.B.A., and the contractor has been Mr. H. Wright, of Dallington, Hammersmith.

The recently issued number of St. Augustine's (Canterbury) *Archaeological Papers* states that the work of unearthing the foundations of the monastery has been continued through the summer, and the eastern end of the crypt of the church is now well exposed to view, and the general plan of the building is about to be protected by the winter's rains and frosts. The discoveries made do not add greatly to what has been already recorded, but it is now much easier to understand the general plan of the building. The commencement, too, has been made on the Chapter House and the under-croft of the dormitory, and sufficient has been found to promise interesting discoveries next year.

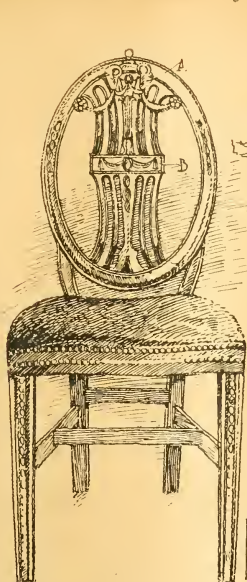
The board of guardians for Boston, Lincolnshire, have had under consideration the proposal to dispose of the present workhouse, which is out of date, and occupies a valuable site near the docks, and build a new one in a more open locality. At the last meeting of the board the clerk stated that the Local Government Board inspector, Mr. Herbert, had seen him and asked him to advise the guardians to employ the services of Mr. P. Gordon Smith, of London, who would be able to tell the board what was necessary. Mr. Herbert has said that a new workhouse was built, accommodation would have to be provided for 200 beds, which would cost from £150 to £200 per bed, involving an expenditure of from £30,000 to £40,000. It was decided to refer the question of erecting a new workhouse back to the building committee.

A lunatic asylum is about to be built at Caerleon for the town council of Newport, Mon. The architect is Mr. A. J. Wood, whose working drawings have been approved by the Home Office.

The corporation of Scarborough have adopted revised plans by the borough engineer, Mr. H. W. Smith, for the erection of a new infectious diseases hospital at a cost of £16,766.



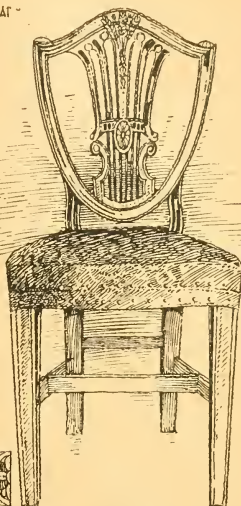
GEOFFRAYS STUDY MONMOUTH



MAHOGANY CHAIR, LATE
18TH CENTY



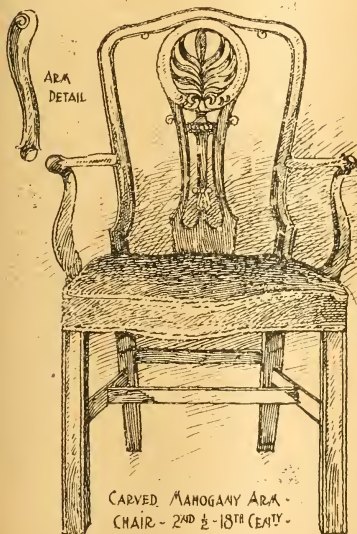
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A.



MAHOGANY CHAIR, LATE
18TH CENTY



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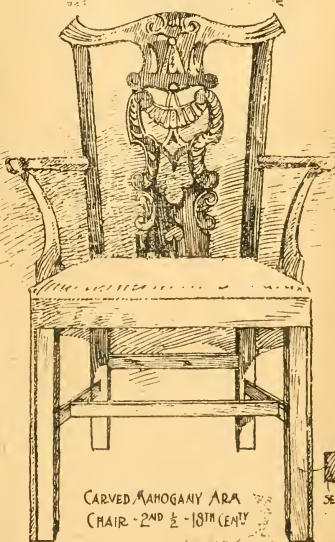


ARM
DETAIL

CARVED MAHOGANY ARM
CHAIR - 2ND 1/2 - 18TH CENTY



MORSE HAIR
SEAT



CARVED MAHOGANY ARM
CHAIR - 2ND 1/2 - 18TH CENTY

SECTION

TYPICAL CHAIRS LATER PART OF THE 18TH CENTURY

Our Office Table.

The protest by the Liverpool Cathedral Petition Committee against the adoption of the St. James's Mount site has been published as a thick pamphlet, with a large-scale map of Central Liverpool as a frontispiece, while two smaller maps are given showing the relative positions of the St. James's Mount and Monument-place sites. The writers, who are organising a petition to Parliament against the Bill under which the corporation of Liverpool is empowered to acquire the St. James's Mount site at a low price, complain that this area is not central, not readily accessible, not commandingly prominent, and without vistas, while it is at present occupied by a public garden and recreation ground. On the other hand they urge that Monument-place is centrally situated, is the Cathedral Committee, is central, commandingly situated, abutting as it does on the main thoroughfare of London-road, and that it provides a vista extending for nearly half a mile, which would be terminated by the west end of the cathedral if this area were adopted. In fact, as the report recently received from the Liverpool Architects' Society observes, the position and approach of Monument-place are unrivalled in Liverpool.

In August last a deputation from the Roads Improvement Association laid before the President of the Local Government Board certain proposals for the reform of the existing system of highway administration. Mr. Long pointed out some difficulties in the way of adoption of these measures, and the Association have now forwarded to him a further memorandum dealing with these points in detail. In particular, it was suggested that the adoption of the reforms proposed would involve large additional expenditure. The Association urged that, on the contrary, the reforms would, if adopted, lead to a considerable saving of the public money. In the first place, the cost of the maintenance of the existing streets and roads is quite out of proportion to the results obtained. In the second, the unnecessary multiplication of small highway authorities is directly responsible for the narrow and irregular streets, which, in London and other large towns have necessitated an enormous expenditure for the purpose of street widenings, street improvements, and the removal of insanitary areas. The recommendations of the association are designed to place some limit upon this great and growing expenditure, and they suggest that the adoption will effect a great saving in the districts that are now being developed, the building of badly-planned streets and the growth of fresh slum areas. They characterise the present system as wasteful and extravagant, and contend that larger highway areas are required, and that a central highway authority to act as an intelligence department should be created, with powers to lay down a minimum width for main roads, and to deal with the difficult questions arising as to the upkeep, strengthening, and repair of bridges. A still more important point is the provision of regulations with respect to the qualifications, duties, salaries, and tenure of official surveyors.

At Tuesday's meeting of the London County Council Mr. Goddard Clarke, chairman of the Building Act committee, replying to questions by members of the Council, stated that copies of the draft by-laws as to lamps, blinds, and other constructions overhanging pavements had been submitted to the metropolitan borough councils for their observation, and the speaker intended to bring up a report after the Christmas recess, and put the Council in a position to discuss the proposed by-laws. The committee had been compelled to consider the necessity of new by-laws from the frequent disputes which occurred with respect to these projections; but there was no idea of putting forward the draft as yet as a final proposal. A code of new rules for theatre construction was adopted. The rules number 32 in all, and provide stringent regulations to prevent fires in theatres. It was agreed to contribute £7,550, one-half of the net cost of widening the approach to the new Brompton-square and No. 186, Brompton-road, proposed to be undertaken by the Kensington Borough Council.

The London County Council, at the same meeting, gave formal consent to the proposals of their General Powers Bill including provisions with regard to the following matters:—Purchase of the Rookery, Clapham Common,

for addition to the Common; purchase of property in Paddenswick-road for addition to Ravenscourt Park; purchase of Fairseat House and grounds adjacent to Wicks Road; acquisition and maintenance of Southfields, Fulham, by the Fulham Borough Council as an open space, and a contribution by the London County Council towards the cost of the acquisition and laying out of the land; acquisition by the Camberwell Borough Council of 77 Brunswick-square, for recreation ground; purchase of One Tree-hill; purchase of sites; and purchase of the Marble-hill estate and maintenance thereof by the Council with the object of preserving and improving the same and the amenities of Richmond-hill, and contributions by the several authorities concerned towards the cost of the acquisition, and also the purchase of other lands by agreement in connection with improving the estate and the view from Richmond-hill.

The schemes embodied in the Council's Tramways and Improvements Bill, of which notice has been given for next Session, were also approved. North of the Thames power is sought to construct the following tramways:—Seven Sisters-road (existing lines), via Amhurst Park to Upper Waltham Cross (existing lines); Chelsea Bridge (north end) via Grosvenor-road, to a point near Lambeth Bridge; Hampstead-road, across Euston-road, and along Tottenham Court-road, to a point near Oxford-street; Edgware-road from a point near the Marble Arch to the county boundary at Frickelewood; Hammersmith Broadway (existing lines), via Fulham, across the High-street, Fulham, and Putney Bridge to the Lower Richmond-road; along the Victoria Embankment from a point near Westminster Bridge to a point near Blackfriars Bridge; and along Elgin-avenue, from Maids Vale to Harrow-road. The following tramways proposed in the Thames are as follows:—Clapham Common South side (existing tramways), via Clapham Common, Battersea Rise, Wandsworth Common North side, East Hill, and West Hill to the county boundary in Kingston-road; Deptford (existing tramways), via Blackheath-road and Hill, Shooter's Hill-road, to the Herbert Hospital, and from thence via Woolwich Common-road, the road to the west of St. George's (garrison) Church into New-road, and Thomas-street and Green's-end to Bensford-square, Woolwich, and returning along New-road and Mill-lane to a point in Woolwich Common-road near Nightingale-place; New Cross High-street, Hinge-street, Lewisham High-street, via Streatham High-road to the county boundary at Norbury; Camberwell Green via Denmark Hill, Champion Park, Grove Vale, and Lordship-lane to a point near the intersection of that thoroughfare with Crystal Palace-road.

The Bill which the City Corporation are promoting in Parliament next Session to empower them to regulate and control the breaking-up of streets in the City by authorities and other persons having statutory or special powers provides that notices shall be required of not less than three months before the opening of any streets, together with plans and sections; that the notice shall be published in the thoroughfares affected; that the Corporation shall not be bound to open in which streets may be opened, and the conditions under which the work may be performed; and that the opening of any street shall be prohibited for a period of nine months from the completion of any previous work in it without the consent of the Corporation, or except in cases of emergency for improvement, or for improvement, and there is power of arbitration by the Board of Trade in questions of disagreement.

The Hammersmith Borough Council have received a report from their town clerk respecting nine railway and tramway schemes affecting the borough to be introduced in the next session of Parliament as follows:—(1) Central London Railway new lines: Proposal to construct underground railways from the present terminus at Uxbridge-road via Goldhawk-road, The Grove, and Beadon-road to the Broadway, and thence via Hammersmith-road, Kensington, Knightsbridge, Piccadilly, Strand, Fleet-street, and Queen Victoria-street to the Bank, and then via Cornhill to Liverpool-street, returning from the latter to the Strand. (2) London and North-Western Railway: Proposal to construct additional archways under Scrubs-lane, adjoining the company's main line. (3) Piccadilly and City Railway: Proposal to construct underground railways com-

mencing from the Broadway, Hammersmith-road, via Kensington, Knightsbridge to Piccadilly, and to acquire for a generating station property in Ship-lane, and to construct proposals to widen Ship-lane and Sussex-place. (4) London County Council tramways and improvements: Proposal to construct a tramway, commencing in Queen-street, opposite Bridge-road, and along Fulham Palace-road over Putney Bridge into Putney. (5) London County Council General Highway Act, 1891: Proposal to acquire Nos. 29 and 31, Paddington-road, and a triangular plot of land adjoining for the purpose of making an addition to Ravenscourt Park. (6) Charing Cross, Hammersmith, and District Electric Railway: Proposal to construct an underground railway, commencing at Castelnau, Barnes, and proceeding under the River Thames via Bridge-road, Broadway, Hammersmith-road, to Knightsbridge and Charing Cross. (7) London United Tramways Light Railway Extension: This proposal includes a proposed light railway from Uxbridge-road along the old Oak-road, via the station, Old Oak-lane, to Willesden. (8) London United Tramways: A proposal to construct tramways along Brook Green-road, Shepherd's Bush-road, Wood-lane, Scrubs-lane, along Netherwood-road, Richmond-road, Norland-road, and a portion of Latimer-road, and also Glenmeadow-lane, along Bulling-road, part of Paddenswick-road, and Askew-road to Uxbridge-road, and along Bridge-road, across the Bridge to Mortlake and Richmond. (9) London United Tramways (electric railway): This is a proposal to construct underground railways from the Broadway via Hammersmith-road, Kensington, Knightsbridge, and St. James's Park to Charing Cross, from the Broadway under Bridge-road to the proposed generating station abutting on the River Thames in the Borough of Fulham, and for the construction of underground railways in Chelsea, Battersea, and Westminster.

The construction of street railways for electric traction formed the subject of discussion at a meeting of the Institute of Junior Engineers on Friday evening, and, in view of the large and rapidly-increasing number of light railway and tramway systems projected, or in course of formation, in this country, such a topic secured a good attendance of members. In a paper by Mr. Pilling, of the importance of the subject, in the absence of the author, many technical considerations concerning the construction of the permanent way were dealt with. One to which special attention was directed was the method of joining the rails, with regard to which the necessity for securing joints that shall be as perfectly rigid at all times give rise to difficulties in the case of tramways which do not trouble railway engineers, and Mr. Pilling expressed the opinion that railway practice in this matter has been too closely followed in tramway construction. Another member, in the course of the discussion, described the plan he had seen followed in Chicago, where the rails are laid upon sleepers, as ordinary railways are here, and concrete is subsequently filled in, and the joints are made with molten metal poured into a casting which serves as a mould. Mr. Pilling urged the need for a larger measure of co-operation than has been customary between the contractor and the engineer for the construction of a line and the traffic manager, in order to secure such an arrangement of points, loops, and terminals as shall facilitate the working of the system, and so increase its earning capacity. He suggested that an electrical tramway is in a better position to earn a dividend than one that runs on frequent turnouts, with a fair number of passengers aboard than that they are run with full loads at less frequent intervals.

In a paper read before the members of the Auctioneers' Institute on Wednesday last week, on the "Legal Problems Connected with the Construction of Tube Railways," Mr. G. M. Freeman, K.C., declared the prophecies that no possible damage would be caused by these lines and not been wholly verified, and that the right to compensation of persons equally injured ought not to depend upon whether a piece of the subsoil under the street was or was not appropriated. In his judgment, all owners who could prove that they had been injured by the construction, or the working of an underground railway should have the same title to compensation. The present uncertainty as to the right of landowners to be heard before committees of Parliament should be removed, and a basis given at least to those within a hundred yards of the line of the tube. If these

modifications of the law were effected, the enormous lengths which the railways would have to be secured without injury to property owners. During the discussion which followed, Mr. H. H. Collins, F.R.I.B.A., remarked that, although an expert might see a very dangerous state of things impending as a result of the construction of a tube, it was, nevertheless, difficult for him to give evidence as to what was safe. After all, the question of safety was not one of the case of the Central London Railway there could be no doubt that the tube was just six inches too narrow, the result being that the rails were so close to it that there was tremendous pounding. Mr. Freeman, in replying on the debate, said he was surprised to hear from Mr. Collins that there was any difficulty in giving evidence as to damage which was not visible. If that was so, what became of the surveyor's profession?

An interesting discovery has been made in pulling down the nave of the parish church of St. Mary, Chatham, for the purpose of rebuilding, some massive Late Norman arches in the west wall having been brought to light. The work has been temporarily stopped, in order that a special fund may be raised to meet the cost of the arches and the remains of the old Norman church. The recovery of this monument of the past has excited much interest among archaeologists, and one local antiquary has offered to contribute £200 towards the extra cost which will be necessary if the Norman remains are utilised and preserved in the rebuilding scheme. From the resuscitation of the detail to portions of Rochester Cathedral, it is believed that it dates back to the years 1130-1140, and evidence exists that the Norman church of which it formed part remained standing until the second half of the 18th century. Some blocks of roughly-worked tufa have also been exposed to view during the demolition, and these are believed to be remains of the original Saxon church.

LORD ROWTON visited Birmingham in company with Sir Thomas Farrell on Friday, and discussed with a number of gentlemen interested in the housing problem a proposal to establish a Rowton House in the city after the style of the establishments in London. It is intended early in the new year to raise a share capital of £40,000, which will be sufficient to provide a home for 600 men. Lord Rowton pointed out that, if the scheme was to succeed, it must be a big one. He began with providing accommodation for 800 men, and 200 beds had to be added. In Manchester there was a scheme for 300 beds; but it proved too small and unremunerative. He suggested that in Birmingham 700 beds should be aimed at, and he thought a 4 per cent. return on the capital was assured. At Southampton, where only 300 beds were provided and no extension was possible, there was endless trouble and the conditions of the lodging-houses were well conducted.

CARSON RAWNSLEY reports the discovery of what seems to be a stone axe-maker's stock in trade on the edge of a marshy bottom known as "The Moss," near Portlincote, about 150 yards from the north-west shore of Derwentwater. The find consisted of two sets of stone cells worked in hard-grained fine volcanic lava, apparently from the same lenders of the material on the spot. The workmen who were digging out the peat to form a fish-pond for the neighbouring owner discovered the cells in two clusters 18 in. to 20 in. below the peat, and laid on the blue clay. The place was densely wooded at the time the cells were made, as was evident from the number of tree stumps of the trees laid along the ground. The three first cells were thrown away by the workmen as only "poor stones," but it is hoped they will be recovered. The four of the second find were laid along beside the disintegrated trunk of a fallen oak. There were no signs of burial here. The cells are unpolished, dulled, beautifully modelled and graduated in size, with a grey-white patina upon them from their long burial beneath the Moss.

SEVERAL drawback to the usual form of safety net for fire-escape, now erected on lofty buildings, is that in case fire breaks out in one of the rooms opening up the escape, the flames, coming out of the window cut off its use by the occupants on the floors above. Furthermore, it may be that a sudden fire fills the hallways with smoke and flame so that the occupants are unable to leave their apartments. To overcome these dangers, Messrs. Gray and Carpenter, of New York, have designed a novel type of fire-escape, for which they have applied for patents in the

United States. It consists simply of an iron ladder hung from wheels resting on an I-beam track, which is supported by steel beams built into the edifice just below the eaves and secured to the roof trusses. The wheels are geared to a differential pulley, the chain of which is long enough to reach to the bottom of the ladder. This allows a person standing at any height on the ladder to handle the chain and compel the entire fire-escape to rise or descend. The beam track runs from window to window, the whole length of the building. The upper part of the frame is continued up and around the lower edge of the roof of the building, so as to be available for the use of any persons who may be on the roof. The iron frame also supports a standpipe, to the lower end of which a steamer hose may be connected, and fire streams taken off from taps located at the different floor-levels.

The city council of Newcastle-on-Tyne have referred to a special committee a report from the schools and charities committee relative to the proposed purchase of land in Northumberland-street and Northumberland-road, as a site for municipal buildings. The local valuation by the borough engineer, Mr. J. Lamb, put the market-price at £140,000, for 15,000 square yards, including the riding school. Communication was made with the Charity Commissioners, asking them to make a valuation of the land, and they replied that they had no information upon which they could form even a general opinion as to the desirability of the proposed sale. They deemed it desirable that a local inquiry should be held. The Charity Commissioners would also have to take down their own value. The committee, before giving to the expense of the inquiry, thought it well that the council should carefully consider the matter, and decide definitely whether this site was the best for new municipal buildings. A report on this point will therefore be submitted by a second committee at the next meeting of the city council.

MR. HARRY HEMS's thirty-fifth annual dinner to his staff, in celebration of the finding of his lucky horseshoe upon his first arrival in Exeter from the north, was also held at the Grosvenor. The large studies had been converted into an ideal Medieval banqueting-hall, and early in the evening exactly a hundred craftsmen, with a few invited guests, sat down to a splendid spread. Afterwards the loving cup, a trophy of Mr. Hems's prowess upon the cinder track more than 40 years ago, went its round. The family punch-bowl was served and refilled, and the smoke from some fire-secre "churchwarden" pipes formed nimbi round the heads of all present. Mr. Harry Hems occupied the chair, whilst the vice-chair was filled by Mr. Greville C. Hems. The printed toast list was interspersed by appropriate quotations from Shakespeare. It also contained "The Carver's Song," written expressly for the occasion by Rev. Robert S. Routh, M.A., vicar of Longstock, Hampshire. The Rev. R. W. E. Bird, M.A., rector of St. Sidwell's, responded for "The Bishops and Clergy"; and the toast of the evening was given by Mr. Silvanus Trevel, J.P., of Truro, the present president of the Society of Architects, and drunk with musical honours amidst much enthusiasm. Mr. Harry Hems and his three sons, Greville C. Hems, H. Turner Hems, and Wilfrid P. W. Hems, suitably returned thanks.

IRRAWADDI the principal supply of malachite so largely used for mantelpieces, pedestals, and similar decorative purposes, has been obtained from Russia; but it is equally abundant and fine in quality in New South Wales, where its colour ranges from pale emerald to deep green, the various layers often possessing different shades of colour, and forming a most beautiful and valuable stone for ornamental and carving purposes. Crystals are occasionally met with, sometimes of large size; those from the Colar mines are particularly beautiful. The silky lustre is often remarkable, the capillary crystals being sometimes several inches long, and compacted together into fibrous bundles. It is found in most of the upper workings of New South Wales copper mines, as in the Bathurst district.

The urban district council of Erdington near Birmingham announced at their last meeting a motion that a public building, of a high degree of beauty, be erected for carrying on the work of the district, and instructing the General Purposes Committee to invite competitive plans and report thereon. The probable cost will be £7,000.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Society of Arts, "Chemistry of Confectioners' Materials," by Mr. J. H. P. G. Cantor, Lecture No. 1, at William Jay, 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "Motive Power from Blast-Furnace Gases," 8 p.m.

WEDNESDAY.—Society of Arts, "Range Finders," by Professor George Forbes F.R.S., 8 p.m. Edinburgh Architectural Association, "Ventilating and Heating," by Balie MacKenzie, 8 p.m.

THURSDAY.—Society of Architects, "Hammered Iron-work," by W. H. Slater, St. James's Hall, Piccadilly, 8 p.m.

FRIDAY.—Glasgow Architectural Craftsmen's Society, "Decorative Work," by W. G. Peble and John McKim, 8 p.m.

CHIPS.

Mr. Leonard Stokes writes with reference to the new Government Offices at Exlandon, Kent: "I have just heard on credible authority that the Office of Works has made a clean sweep of the whole of the sloping roofs as designed by Brydon, and substituted flat asphalt on instead. How does this tally with their recently-published plans?"

Lord Grimthorpe, K.C., has sustained a severe bereavement in the death of his wife, at the age of 78. The late Lady Grimthorpe, who was a daughter of the late Sir Lonsdale, Bishop of Lichfield, was married to Mr. Edmund Denison, afterwards Sir E. Beckett, and now Lord Grimthorpe, in 1815.

New National day and Sunday-schools at Spring Gardens, Churchgate, Stockport, were dedicated on Sunday. The site of the present schools and the buildings at Wellington-road South, directly opposite the Stockport Infirmary, have been acquired by the corporation with a view to the erection of a town-hall and municipal buildings. The new schools have cost about £8,000. There are separate departments for boys, girls, and infants, and an assembly-room, the accommodation being for 600 day scholars. Messrs. Scott and Sons, Manchester, are the architects, and Mr. Josiah Briggs, Stockport, is the builder.

A memorial tablet to the late Mr. Samuel Day was unveiled on Saturday in the congregational church at Ilfracombe. It is placed in the south wall, and measures 8 ft. by 5 ft. It is decorated with Gothic in style. The tablet is white Carrara Bianca marble from Carrara. The architect was Mr. Allen T. Huxell, and the work was executed and fixed by Mr. J. P. Huxtable, also of Ilfracombe.

Mr. F. A. Everill, of Worcester, Fellow of the Institute of Architects, and president of that Institute in 1895-96, died at Worcester on Tuesday night, after a long and painful illness. He was secretary of the Worcester Orphan Asylum and other philanthropic bodies.

The city council of Winchester have adopted a plan by Mr. M. Anderson, the city surveyor, for rebuilding the Guildhall, at an estimated cost of £1,500. The acoustic properties of the hall have always been lamentably defective.

The annual dinner of the Institution of Electrical Engineers was held at the Hotel Cecil on Monday, Mr. W. Langdon (president) occupying the chair. The company numbered upwards of 300. The toast of the evening was given by Sir David Tennant, who mentioned that the institution had now been in existence thirty years, and had 4,000 members on its roll, including 600 students. The chairman, Mr. Langdon, then referred to the last two years local sections of the institution had been established at Glasgow, Newcastle, Manchester, Birmingham, and Dublin. With a view to the further extension of the influence of the institution, similar sections have been established in Calcutta and the Cape of Good Hope.

The Hon. W. W. Vivian, who has for many years held the post of general manager of the great Dinorwic slate quarries, Carnarvonshire, now the largest slate quarry in the world, will retire from that post in the near future. Mr. Arthur Ashurst Smith, the owner of the Dinorwic quarries, has appointed Mr. Ernest Neale, late superintendent of the Chester and Holyhead district of the London and North-Western Railway, in Mr. Vivian's place. Mr. Neale has held for some years occupied the post of assistant-general manager.

The gas and water committee of the Carlisle Corporation have adopted a scheme of reorganisation of the management of the gas and waterworks of the city. The scheme provides for the appointment of Mr. H. M. Mackay, the present city surveyor, to the post of water engineer at a salary of £150 a year, and of a gas manager, who will be advertised for, at a salary of £350 per year, to devote his whole time to the duties, and to have a knowledge of the manufacture of carburetted water gas.

BUILDINGS—continued.

<p> Orchard-on-Sea—Two Shops, Hergate-avenue Evesham—Fair of Villages, Greenhill Park Estate South—House, Victoria-road Marple—National Schools Hall—Rebuilding Tally Ho, Bond-street Leggett— Hay—Mansion on Sea Front Blyth—Steam Drying Shed Clifton—Schools, 1,020 places, St. John's-pl. Forres—Cunningham-street United Free Church Dinnington Colliery—Rebuilding Cottages Southwell—Cottages, Rebuilding </p>	<p> Greenhalgh and Brockbank, Architects, Bank Chambers, Southend F. Foster, Architect, Loughington S. John and Carter, Architects, Bank Buildings, Cardiff James Hunt and Son, Architects, 4, Warren-street, Stockport Freeman, Son, and Gaskell, Architects, 11, Carr-lane, Hull S. Worthington, Architect, Leeds Clayton and Black, Architects, 132, North-street, Brighton The Birch Brick Co., Ltd., Lincs-road Works, Rye N. J. Jennings, Architect, 10, Margaret-st., Canterbury Ross and Mubbert, Architects, Queneage Chambers, Inverness Inverness Iron Coal Co., Ltd., 4, Exchange Buildings, Newcastle E. N. Cubitt, Architect, Broadway, E.C. </p>
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ELECTRICAL PLANT.

Gouthampton—Electric Motors	Ordinance Survey Director-General	Preese and Carlew, 8, Queen Anne's Gate, Westminster, S.W.	Dec. 11
Reading—Cables	Corporation	Arthur Ellis, M.I.E.E., M.I.E.E.E., The Hayes, Cardiff	14
Swansea—Electric Power Station Plant	Urban District Council	Edmund Wilson, 10, St. Vincent Street, Glasgow	14
Horsesham—Motors, etc.	Urban District Council	W. C. C. Hawtayne, 9, Queen-street-place, E.C.	17
Christiansia—Telegraph Material	Norwegian State Railways	The Commercial Dept. of the Foreign Office, Whitehall, S.W.	17
Osaka—Plant	Corporation	Edmund Wilson, 10, St. Vincent Street, Glasgow	17
Hamstead, N.W.—Elec. Fire Alarm System at Forest Hospital	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Embankment, E.C.	19
Hamstead—Plant	Midland Electric Corporation	Kincaid, Waller, & Marville, Engs., 29, Old Gloucester-st., W.	21
Reading—Reconstruction of Elec. Bells, Handset & Holbeck Bells	Corporation	John Bowden & I. E. Winslow, Engineers, Reading	21
Reading—Plant for Electrical Tramways	Urban District Council	W. H. Frothingham, 10, St. Vincent Street, Glasgow	Jan. 13
Swansea—Plant	Urban District Council	Robert Hammond, M.I.E.E., 64, Victoria-street, S.W.	13
Norwich—Plant for Municipal Electricity Works	Urban District Council		

ENGINEERING.

[illegible]

FENCING AND WALLS

Nottingham—Iron Hurdle Building, 1688 (Bus) at Cemetery..	Public Parks Committee	Frank B. Lewis, Architect, Guildhall, Nottingham	Dec. 16
Renfrew—Gates and Railings at new Cemetery	Parish Council	Peter Kerr, Civil Engineer, Johnstone	" 17
Murmead—Boundary Wall 55/4 ft. at Union Gardens ..	Woolwich Union Guardians	J. O. Cook, Architect, 14, Eleanor-road, Woolwich	" 19
Enfield—Oak Fencing, Waterworks Site, Hadley-road ..	Urban District Council	Richard Collins, Surveyor, Court House, Enfield	" 18

FURNITURE AND FIT

Inwick—Workhouse Boardsteads	Guardians	H. W. Walton, Clerk, Atwick	Dec. 19
Lee & Co.—Fitting-up Showyard, Roundhay Park	Yorkshire Agricultural Society	J. Mangham, Secretary, Alkwick-street, 1088	—
Dublin—Bedsteads—218*	General Prisons Board	E. Metcalfe, Controller of Industries, Dublin Castle	—
Weston-super-Mare—Furniture and Fittings for New Pavilion	Urban District Council	Hugh Selfelton, Surveyor, Town Hall, Weston-super-Mare	—
Hampgate—Furniture and Chairs 400, at Winter Garden	Wells and Baths Department	Alfredson L. D. D. Manger, Royal Baths, Harrogate	—
Norwich—Furniture 1000		Frank Hazell, Secretary, Norwich	—
Hamilton—Ornate Furnishings	Lanark County Council	The Medical Officer, Public Health Office, Hamilton	—

PAINTING.

Leeds-Corn Exchange	Corporation	The City Engineer's Office, Leeds	Dec. 16
Chartham Downs-Three Blocks of Buildings at Asylum	Committee of Visitors	W. J. Jennings, Architect, 4, St. Margaret-street, Canterbury	20
Leeds-Searcroft Hospital	Corporation	Edwin T. Hall, F.R.I.B.A., 54, Bedford-square, W.C.	Jan.

PLUMBING AND GLA

Abyrne—Plumber and Cement Works at Castle	Davidson and Garden, 12, Deo-street, Aberdeen	Dec. 16
Bristol—Easton School	J. Mackay, Architect, Kingswood, Bristol	" 16
Dewsbury—Covered Market	H. Dearsay, A.M.I.C.E., Bro. Eng. Town Hall, Dewsbury	" 31

ROADS AND STREETS.

Davenport - Street Works	Town Council	J. P. Burns, Borough Surveyor, Municipal Office, Kersel, Devonport. Dec.	14
Derby - Repairing, etc., Viewlands-road	Town Council	John Bess, Town Clerk, Perth.	14
Dorchester - Street Works	Highways and Drainage Committee.	M. J. Gorge and J. Boro' Engineer, Town Hall, Eastbourne.	14
Blackburn - Street Works	Highway Committee	W. Stubbs, A.M.I.C.E., Boro' Eng. Municipal Offices, Blackburn.	14
Fulham, S.W. - Roadway, &c.	Insurance	A. Saxon Snell, F.C.I.A., 22, Southampton Buildings, London.	17
Belfast - Street Works	Young and Macdonald, Engineers, Belfast.		17
Tottenham, N. - Asphalt Paving 300 yards	Urban District Council	W. H. Prescott, A.M.I.C.E., Engineer, 712, High-road, Tottenham.	17
Doncaster - Street and Road Works	Urban District Council	Walter F. Lockyer, Engineer, 10, Elm, Hemel Hempstead.	17
Enfield - Street Works	Urban District Council	B. Collins Surveyor, Court House, Enfield.	17
Walthamston - Paving, Kerbing, and Channelling Streets	Urban District Council	G. W. Holmes, Surveyor, Walthamston.	17
Southampton - Street Works	Urban District Council	C. Alfred Ford, A.M.I.C.E., Borough Surveyor, Smithson-on-Sea.	23
Kilmarnock - Paving Portland-street	Town Council	R. Blackwood, Borough Surveyor, Market Bridge, Kilmarnock.	23
Whitby and Monkseaton T.D.C.	Whitby and Monkseaton T.D.C.	James Brown, A.M.I.C.E., Newcastle-on-Tyne.	23
Cardiff-grove - Granolithic Footpath	Urban District Council	James Boyd, Town Clerk, Cardiff-grove.	23
Osau - New Road	Urban District Council	Edmund and Sutherland, Royal Bank, Osau.	23
Netherton - Lining Streets	Urban District Council	W. Oswald, 62, Church-road, Netherton.	23

SANITARY.

Wantage - Sewerage and Sewage-Disposal Acts	Urban District Council	Dec. 14
Horsemy - Sewers 1,200ft. run of 4ft. 6in. by 3ft.	Urban District Council	"
Tipton - Storm-Water Drain at Toll End	Urban District Council	"
East - Sewers	Urban District Council	"
Sutton Coldfield - Sewers and 400 yards lineal	Urban District Council	"
Bury, Lancs - Sewage Disposal Works	Urban District Council	"
Leahurst - Sewage Works	Urban District Council	"
Norland - Sewers	Urban District Council	"
Campton - Sewers	Urban District Council	"
Wantage - Sewerage, and Martin, 7, Bedford-cire, Exeter	Urban District Council	"
E. J. Lovgrove, Engineer, Southwood-lane, Highgate, N.	Urban District Council	"
W. H. Jukes - Surveyor, Dean-street, Tipton	Urban District Council	"
W. Taylor, Surveyor, St. Mary's, Exeter, S. W.	Urban District Council	"
W. H. O'Clarry, Borough Engineer, Town Hall, Sutton Coldfield	Urban District Council	"
Arthur W. Bradley, Borough Engineer, Bury	Urban District Council	"
W. Steward, Architect, Bury	Urban District Council	"
G. Gordon, Surveyor, Clifton, Brighouse	Urban District Council	"

SANITARY

London—Sewerage and Completing Parkfield-place
Waltham-down—Tud. ground convenience, St. James-street
Mosses—Sewer, Otley-road
Mosses—Sewer, Otley-road
Nantmon—Underground convenience, Church-street
Nantmon—Sewer, &c.

Corporation
Barn District Council
Urban District Council
Corporation
T. H. Andrews, Engineer, 1, Faversham-st., St. Austell.
Corporation
Urban District Council

C. Brownridge, A.M.I.C.E., Borough Engineer, Town Hall, Birkenhead ... Dec. 18
B. L. Pritchard, Surveyor, 8, Castle-street, Brecon ... 18
G. W. Homes, A.M.I.C.E., Town Hall, Waltham-down ... 20
F. Baskin, Borough Surveyor, Municipal Offices, Harnage ... 21
T. H. Andrews, Engineer, 1, Faversham-st., St. Austell ... 21
The Borough Surveyor, Town Hall, Preston ... 21
Arthur Hartley, County Chambers, Castledore ... 21

STEEL AND IRON.

Dundee—Points and Crossings
Dundee—Cast-iron Piles, 1,400 tons
Dundee—Steel Piles, 10,000 tons and Fishplates, 10,200 tons
Dundee—Cast-iron Piles, 1,400 tons
Dundee—Iron and Steel Work to Engine-shed, Neville Hill
Manchester—Steel Piles, Rochdale-road Station
Dundee—Steel Piles, &c.
Christiansburg—Water-Pipes

Harbour Trustees
Corporation
South-Eastern Railway
Urban District Council
North-Eastern Railway Co.
Corporation
Norwegian State Railways

J. Thompson, Jun., Harb. Engr., Harbour Engineer's Office, Dundee ... Dec. 14
H. Hill and Sons, Civil Engineers, Albert Chambers, Manchester ... 14
The Commercial Department, Foreign Office, Whitehall, S.W. ... 16
Sydney Francis, Engineer, Town Hall, Clacton-on-Sea ... 16
William Bell, Architect, York ... 18
J. H. Newbiggin, Engr., C.E., Rochdale-road Station, Manchester ... 19
John Young, General Manager, 88, Renfield-street, Glasgow ... 20
The Head Engineer's Office, Narvik, Norway ... 20 Jan. 20

STORES.

Abbeville—Works and Materials (One Year)
London, S.E.—Sheet Lead, Pipes, &c. One Year
Andover—Drainpipes, &c.
London—Broken Cans, 1,500 tons
London, E.C.—Brass Boiler Tubes
Chorley—Engine and Firebricks
London, E.C.—Metals
Amsterdam—Copper, Water-Pipes, Telegraphic Apparatus, &c.
London—Firebricks, Firebricks, &c.
London—Portland Cement, 3,000 tons
Southend-on-Sea—Towing Blocks and Slabs

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South-Eastern Railway Co.
Netherlands Ministry of the Colonies
City Committee
Highway Committee
Corporation

Wm. Dyack, Borough Surveyor, Town House, Aberdeen ... Dec. 14
The Superintendent, Guy's Hospital, S.E. ... 14
R. W. Knapp, Surveyor, Town Hall, Andover ... 14
Geo. Lloyd, Highway Surveyor, North-street, Romford ... 16
The Offices, Gloucester House, Bishopsgate-street Without, E.C. ... 17
J. W. Allen, Gas Engineer, Chorley ... 17
Edw. Z. Thornton, Sec. 46, Queen Anne's-gate, Westminster, S.W. ... 17
The Commercial Department, Foreign Office, Whitehall, S.W. ... 18
R. H. Townsend, General Manager, Gas Offices, Leeds ... 19
A. M. I. C. E., Borough Engineer, Town Hall, Birkenhead ... 21
Alfred Harty, A.M.I.C.E., Borough Surveyor, Southend-on-Sea ... 21

CHIPS.

Mr. W. Cooper, of Hastings, has taken into partnership his chief assistant, Mr. H. W. Cousins, A.R.I.B.A. Mr. Cooper was recently elected a member of the Hastings Town Council.

The additions to the isolation hospital, Alersholt, are being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke-flues and special vertical inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

At St. Paul's Church, Woodford Bridge, on Saturday, November 30, the Lord Bishop of St. Albans dedicated the reredos which has been erected. It is of alabaster, and has six opus-sectile panels, in which are figures of St. Matthew, St. Mark, St. Luke, St. John, St. Peter, and St. Paul. The reredos, and also a credence table which has been erected, were executed by Messrs. Dutcher and Axtell, architectural sculptors, of Camberwell-road. The work was carried out under the supervision of the architects of the church, Messrs. William G. Bartlett and Son, of New Broad-street, E.C.

Bart-on-on-the-Heath Church will shortly receive a three-light memorial window from the firm of Messrs. Swaine, Burnie, and Son, King Edward's-road, Birmingham. The subjects in upper tier consists of Our Lord in Majesty, St. Stephen and St. Luke respectively on either side; the lower tier the Martyrdom of St. Stephen; whilst the tracery will contain elaborate ornamentation and eulohastical subjects.

Glenborrodale Castle, in the West of Scotland, has lately been rebuilt for Mr. Rudd, the South African millionaire. The whole of the metal casements in this mansion and the hanging-box at Sheldra Bridge, for the same gentleman, have been executed by Williams Bros., of Chester and London.

We are asked to state that the whole of the terra-cotta used in the Robin Hood Baths, Oldham, which was illustrated last week, was supplied by Mr. Henry Dennis (The Rubicon Coal and Coke Co., Ltd., Runcorn).

A new parish hall has just been opened at Coalbrookdale, Shropshire. A freely treated Late Perpendicular design, its tracery windows and dressings are of Grimsby stone in Rural on brick walls, covered by red-tile roof, the latter being a new method of construction, with arches and tracery trusses to the main hall. Mr. T. Pace, of Shrewsbury, is the contractor, the architect being Mr. Harbottle Reed, of Exeter.

The new "Robert Hall Memorial Church" has been opened in connection with the Baptist denomination at Leicester. It has cost £12,000.

A new system of steel roofing has been patented in America which, it is thought, there, may displace galvanised iron for roofing purposes. The system of manufacture consists of steel strips bent cold in the press, the covering being formed of plain galvanised sheet metal back on the edges and locked into tubular rafters.

In the list of retaining orders in Tuesday's *Chronicle*, the name appears of James Martin Hatfield, Delft-yield, Putney, S.W., late High-street, Putney, architect, surveyor, and builder.

The growth seaward of Dungeness Point, caused by the seaward shift of shingle, has caused the formation of a new spit of land, which has become necessary, and the contract has just been placed with a firm to carry out the work for £6,000. This work is to be carried out on Dungeness Point. The spit, built about 60 years ago, is now a narrow strip of land, the high-water which, surrounded it, is now about half a mile from the seashore.

The Marquis of Northampton formally opened, on Friday, a building at Leicester for the Young Men's Christian Association, which has been erected and furnished at a cost of about £40,000. The new edifice occupies a commanding position in the main thoroughfare, opposite the Midland Railway Station. In addition to all the ordinary requirements, there are large smoking, and refreshment rooms, there are large lecture-hall, and gymnasium. Ordinary shower, and plunge baths are provided, and there are 30 bedrooms for boarders. There are four floors and the main staircases, all of which are of fire-proof construction.

The members of the urban district council for Kingswood, near Bristol, have inspected the temporary drainage works at Lantern Bottom, Kingswood, which have been devised and carried out on the septic-tank principle under the superintendence of the surveyor, Mr. A. J. Saise, A.M.I.C.E. The members expressed their satisfaction, and the second section will be gone on with forthwith, so that the other works will be completed well within the time for which the injunction of the Wansley rural district council has been suspended.

An inquiry is about to be held at Brentwood into the application of the urban district council for sanction to borrow £6,000 for the purpose of the Housing of the Working Classes Act.

Horeb Baptist Church, Tylorstown, Mon., was opened on Saturday. The edifice, designed by Messrs. Griffiths and Jones, of Birmingham, has been built at a cost of £2,000 by Messrs. Humphreys Bros., contractors, Tylorstown, and will accommodate 800 persons.

It is stated that the King proposes to cut the first sod for the Queen Victoria Memorial at the end of June or early in July. The total contributions now collected are £282,000.

New branch co-operative stores in London-road, Winton, were opened last week. Mr. William Munford, of Preston, was the architect, and Mr. William Molyneux, of Northwich, the builder.

In the case of the application on behalf of George Edward Maxwell, Lansdown-road, Clapham, S.W., builder, the order of discharge was suspended for two years, ending Nov. 1, 1903; also that on behalf of Edward Melson, Basinghall-street, E.C., and Thames Ditton, contractor, the order of discharge has been suspended for two years, ending Nov. 1, 1903.

At the last meeting of the Buxton Urban District Council, the electricity committee recommended that Mr. Leeming, assistant electrical engineer, be offered the post vacant by the resignation of Mr. Calvert, at a salary of £150 a year. The recommendation was adopted, and Mr. Calvert was appointed consulting engineer, subject to certain terms.

The Hon. Mrs. Gretton laid, on Friday, the memorial-stone of a new Wesleyan Church which is to be erected at Stapenhill, Burton-on-Trent, to seat 100 people.

Mr. E. A. Sandford Fawcett has held an inquiry at Grimsborough into the application of the urban district council for sanction to borrow £25,000 for works of sewerage improvement.

The Minister for Works of New South Wales officially opened in November the railway which has been constructed from Koorawatha to Grenfell. This new line is thirty miles, and is of the light type. The original estimate for the work was £62,350, but this has been exceeded by 10 per cent., owing to additional station accommodation having been provided. Mr. Wickham was the officer in charge of the work, under the engineer-in-chief for railway construction.

The old Atlas Foundry in Water-street, Cambridge, has just been reconstructed into theatre by Mr. William Aitken, and was opened on Monday. The building is seated for 700, and has been fitted with electricity throughout.

A new branch railway in the North Riding from Cough Fleet, near Middlesbrough, to Eton, will be opened on January 1. It is three miles in length, and runs due south to Foston, where the terminal station has been built by Messrs. Bateman, of Middlesbrough.

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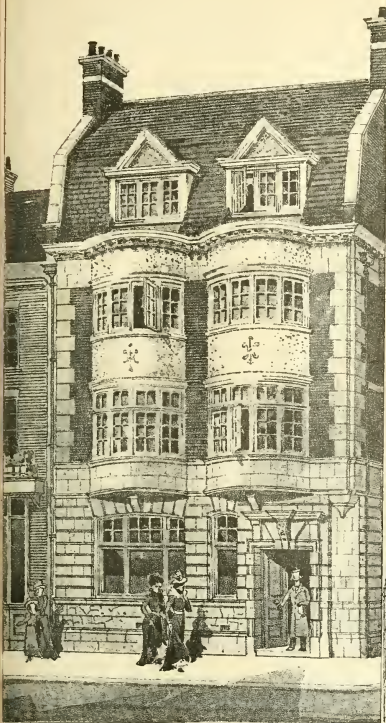
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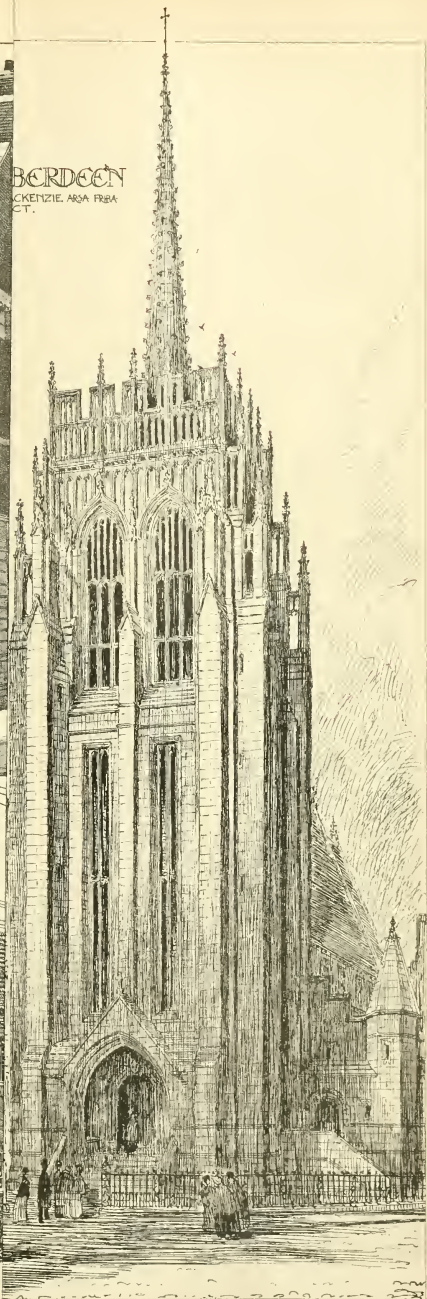
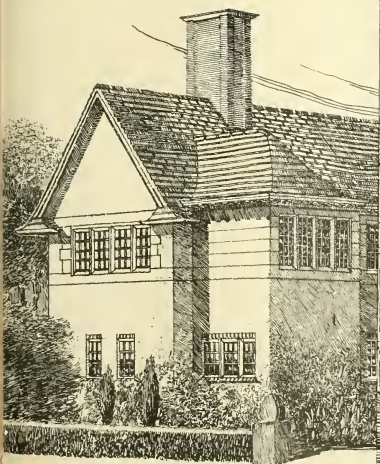
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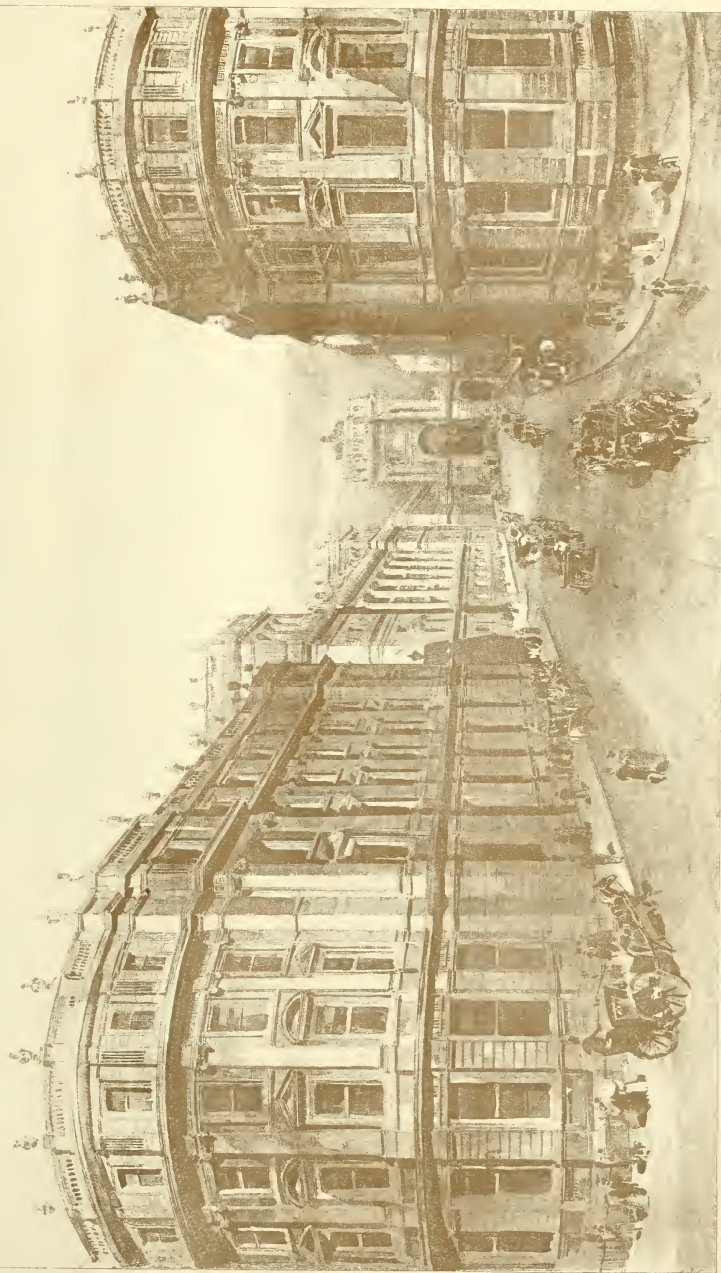
THE BULLDOG NEWS, DEC 13, 1901.



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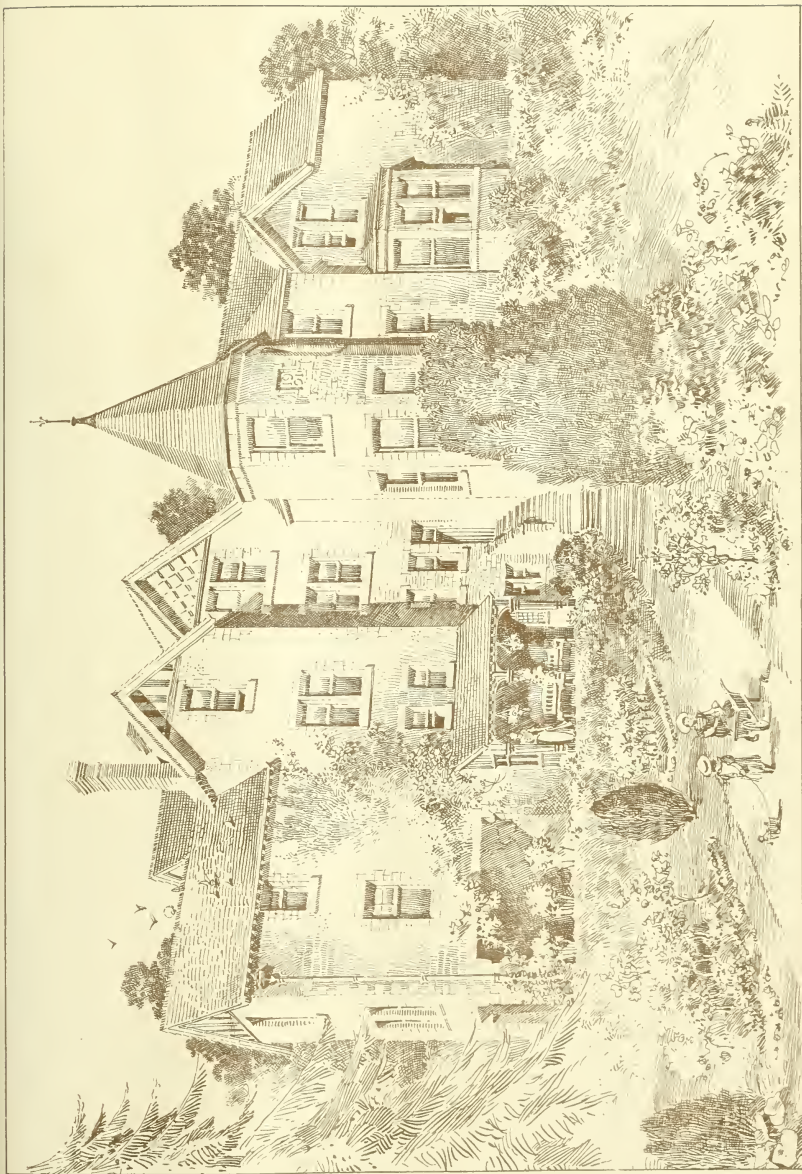




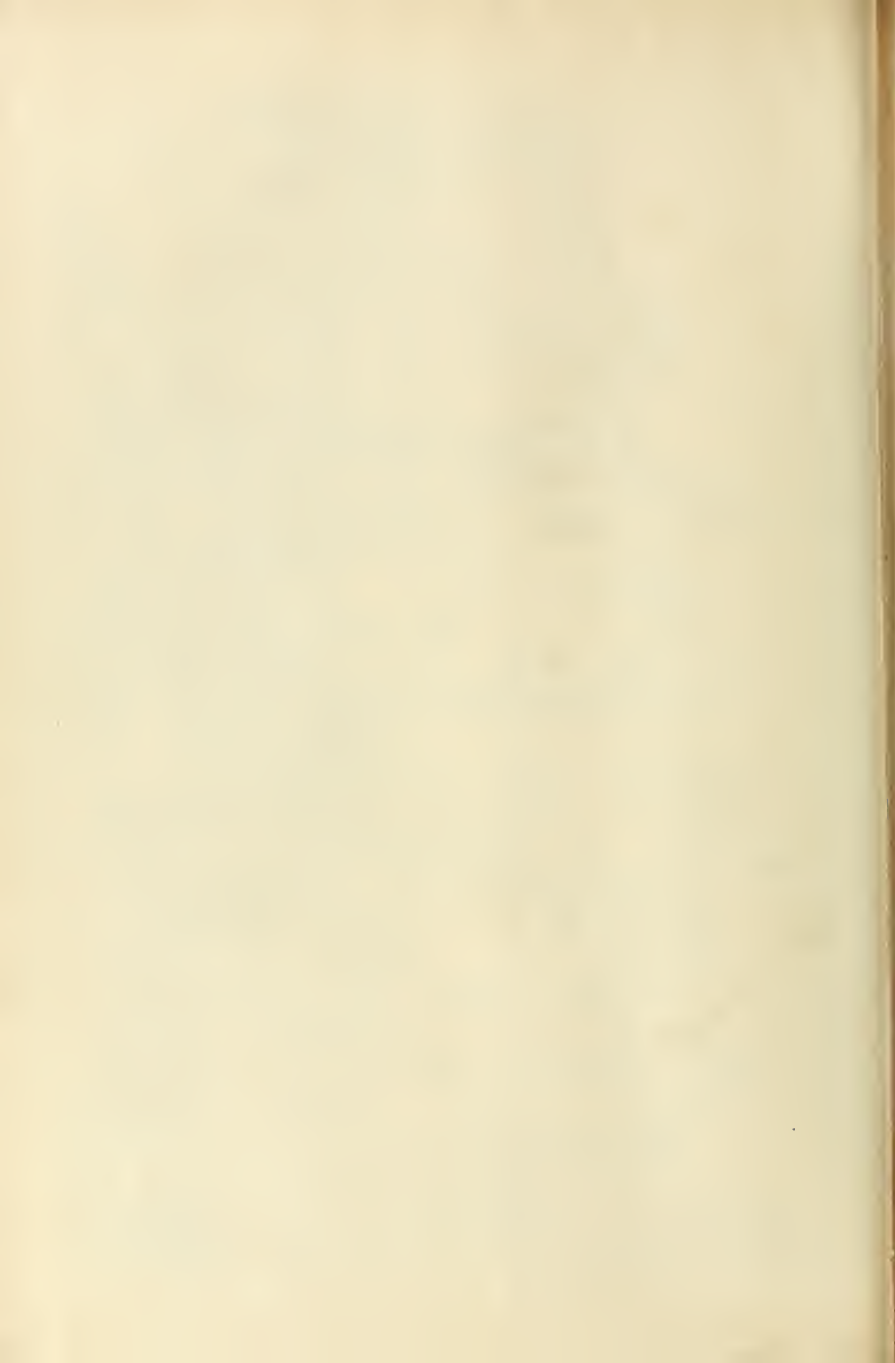


VICTORIA MEMORIAL. ENTRANCE FROM TRAFALGAR SQUARE

DESIGN BY SIR THOMAS DREW PRHA



• Additions & Alterations to "Pias Nant-y-Glyze" Colwyn Bay N.W. for Mrs. Schill. • Booth, Gadwick & Bates, Architects



And when the architect's real work is thus delegated to others, one result is overlapping.

The overlapping of the professional works of architects and engineers is now becoming so great in American cities that the American Institute have recently recommended an amendment of the schedule of charges for architects, that the minimum fee of the architect for portions of his work involving electrical, mechanical, and sanitary engineering, heating and ventilation, be made 10 per cent. of the cost, and that the architect select engineering experts, who will render their services under his supervision. But these engineering branches do not encroach on the architect's special work. They are all more or less modern scientific developments, which we cannot expect the architect to master. But when he hands over his construction—say a roof or a dome to the engineer or iron and steel structural engineer, or the arrangement of furniture or interior decoration to an "artist" or tradesman, there is an encroachment that is difficult to justify. The limits of every man's art may, and should, be restricted by particular conditions under which he works. We do not expect a carpenter to perform a mason's or a plasterer's work, nor should the architect be expected to do an electrical or heating engineer's work. The overlapping of which we speak is a disregard of restriction of any kind—permitting a practitioner in the profession to do anything, or to delegate his duties to another, for the one purpose of doing business.

THE CAMBERWELL BATHS AND WASHHOUSES COMPETITION.

AS we briefly announced last week, fifty-two designs have been submitted for the proposed baths and washhouses to be built in the Old Kent-road by the Borough Council of Camberwell. The designs which Mr. A. Sixton Snell, the assessor, had to select from contained many by architects of repute in this branch of practice, and, as only three have been selected for the premiums, it goes without saying a large number of the plans have been set aside. The site presented some difficulties. The north end of the plot is bent at a considerable angle to the west, and the boundaries follow this irregularity, and are not rectilinear. How to place the two large swimming-baths on the site was not an easy matter. The larger number of the designs show them placed parallel with Marlborough-road on the west portion of area, side by side, but their ends not coinciding, the first-class bath being a little in advance of the smaller swimming-bath, and this we think the most reasonable position, as being axial to the main frontage. Several authors show them placed in a transverse direction, their ends abutting on Marlborough-road; and a few place the larger bath at side of the road, and the smaller one tilted to the angle in the rear. If for no other reason than the facility for easy entrance and exit from the larger hall, its location, with its long side to Marlborough-road, is a *sine qua non*. We can only notice the chief features of the three designs selected for premiums, and a few of the other plans which show evidences of skilful arrangement. The design placed first by the assessor, illustrated on p. 853, shows a few good points in planning. The entrances, waiting-rooms, and halls for men and women are convenient and roomy; the first-class swimming-bath, to be used as a hall for entertainments, is placed alongside Marlborough-road, with a side-corridor, three exits, and gallery exit. The main entrance from Old Kent-road has two vestibules, with ticket-office between, to the large hall and gallery, distinct from the bath entrances, leading to a circular heated bath. A ladies' cloakroom is close to that corner. This separate entrance is absolutely necessary for a public hall, though we find some of the plans are without it. There is also a side entrance for artistes,

adjoining the first-class swimming-bath or hall, and parallel to it, but set back some feet to admit of a clubroom, an area for light, and second-class women's waiting-room, is the second-class swimming-bath. The men's and women's halls are approached directly through lobbies; on the men's side is the stairs to men's private baths. On the women's side of entrance is the first-class waiting-room, with door direct into their first-class slipper-baths at the rear corner. Beyond, in line with it, forming the eastern annex, is their second-class slipper-baths. All this planning is convenient and spacious. To obtain more room, the author breaks forward his front on this side, leaving the entertainment-hall front slightly recessed. Between the halls for both sexes, central with second-class swimming-bath, is the stairs to Turkish bath in the basement; but the lighting of these is not quite so good as it might be. The washhouse, with side entrance and corridors behind the large swimming-baths, are convenient. On the first floor we have, in front of the large bath, good stair exits from gallery, and facing the Old Kent-road the board offices. In front of the other bath are the men's first-class private baths, their second class being in the rear.

To conserve space by making the most of the width of the site and to obtain the exit corridor on the Marlborough-road side, the author has ingeniously utilised the space under the galleries of his large swimming-bath. This is done by setting inwards the row of dressing-boxes from the outer wall, placing them under the front row of gallery seats. The same expedient is adopted on the inner side next the smaller swimming-bath, the dressing-boxes of the latter on this side being placed within the width of gallery of the larger bath, so that they do not project into the area of the second-class bath. On the other sides the boxes are obtained similarly by placing them outside the line of roof; so that both side rows are exclusive of the area of swimming-bath under the roof space. Iron columns on both sides are therefore necessary to support the roof. In this manner the two swimming-baths interlap by the width of the dressing-boxes on one side. By this expedient the author is enabled to throw the depth of one row of boxes into the area of his smaller bath. To obtain the necessary three rows of seats on the side galleries of the large swimming-bath—a condition looked for by the instructions—the front of gallery is made to project from the face of the boxes below. The section shows a bold segmental curved roof springing from iron columns a few feet from the external walls.

To our minds the chief objection to this plan is the manner in which the author obtains the required area for his second-class slipper-baths, which are placed over a considerable area of his second-class swimming-baths, which leaves a large portion of it in darkness. The light obtained by a small area at one end, and through the main lantern light of the unheated portion of the swimming-bath at the other, is inadequate, and we think the bath is spoiled by this awkward arrangement. Has the assessor really considered the effects of this covering-over the swimming-bath? The conditions explicitly confine such flooring to the ends of bath only. No doubt to some extent it was unavoidable, owing to the large area of plan taken up by the entrances and halls in front; but we think both swimming-baths should be intact, and uncovered their whole height. The clubroom on ground floor, leading out of men's hall, is not of the area required by the conditions. The lighting of the basement is hardly sufficient, three skylights in the forecourt being shown over the hot and cooling-rooms, plunge, &c., with the areas at the end of the second-class bath; but these are scarcely enough. We notice also that small provision is made for the

boilers in the basement. The cold-water tank (60,000 gallons) is placed over the back of washhouse carried by girders and columns on the inside. The establishment laundry is placed in the rear of large bath, with towel-shoot to private baths. The external elevations to the Old Kent-road and side road, of red brick, relieved presumably by terracotta in a simple manner, are of the stereotyped style.

The second design, by Messrs. G. B. Russell and C. E. Mallows, F.R.I.B.A., varies a little from the first in having the second-class swimming-bath sunk below the level of the first-class, with subways below (and we may just question whether this will allow of sufficient fall to the sewer and entail lifting by pump the lower bath water). By this arrangement the authors obtain a greater width to their second bath without encroaching on the area of ground floor. In addition to this advantage, the area of the smaller bath can be floored over at a level with the large hall for entertainments, its area being partly used for a super-room, a crush hall 36ft. by 15ft., and cloakrooms. This is shown by the cross-section; eirestrosy lights to the large bath are also got by this plan over roof of the lower swimming-bath. The plan of entrances is fairly good, and is placed opposite the second-class swimming-bath, with ticket-office in centre, and men's first-class entrance at the side, with separate pay-office. The large swimming-bath, 75ft. by 30ft. (making a hall of 90ft. by 45ft.), is entered at its inner side. Next to the men's first-class entrance is the women's, leading to their first and second-class private baths at the side. The men's first-class slipper-baths are over the women's, with waiting-room in front, and their second class on ground floor, behind the women's. A good entrance is shown to laundry at the angle on the Marlborough-road side. Near it is the men's second-class entrance and stairs down to bath, with waiting-room, and next it the artistes' entrance leads through clubroom to the large hall. The basement contains the second-class swimming-bath before referred to, and is fairly lighted in front over hot baths and boiler entrance, and is placed opposite the front elevation, in red brick and stone has a centre tower over public entrance to hall, with ornamental lead cupola. It is architecturally designed, and the large bath or hall is pronounced by a gable and made a feature distinguished from the baths proper portion with its three entrances. The author has kept in view the public purposes for which the large bath is intended; but we doubt whether the sinking of the smaller bath will not exceed the regulations as to drainage.

The third design (by Mr. H. Dighton Pearson) is well studied, in the main. The large swimming-baths are placed, as in the first design, on ground-floor level; the women's second-class private baths are on the east side, with their first-class in front, and waiting-room. There is a wide corridor entrance for women, and on the other side of pay-office is the men's corridor, with clubroom in front. The men's first-class swimming-bath has a wide front entrance, rather on one side, suitable for entertainments, a clubroom and cloakroom next entrance at the corner, with the regulation three exits along Marlborough-road. The second swimming-bath is approached by a corridor from Marlborough-road at back of the larger bath with gallery entrance; the washhouse with 50 stalls is behind. The upper floor shows men's first-class private baths along the front, with waiting and committee room, and their second-class private baths over the washhouse at back, and part over swimming-bath. The Turkish bath in basement in front is lighted by skylights in front of entrance corridors. A tank of 12,000gal. is placed over second-class men's waiting-room between large swimming-bath and men's second-

class private baths. Generally there is compactness in the arrangement. An establishment laundry, connected by towel-lift direct to men's second-class baths, is provided. The plan has a better arrangement of side entrances at the Marlborough-road side than the last. These consist of a washers' entrance, the second-class men's entrance direct to this swimming-bath (75ft. by 30ft.), a gallery exit, and artists' entrance to dressing-rooms. This design has unquestionable artistic merit in the external treatment. The brick and terracotta are broadly treated. There is no tower or external feature, save only in severe gable of brick in the Old Kent-road.

Comparing the relative merits of these three designs, there is a better front arrangement of entrances and waiting-rooms in the first plan than in either of the two others. The large bath or public hall is made more decided and distinct from the other part of the baths. There is an end entrance to hall, instead of a side one, as in the second design. On the other hand, the planning of side entrances to baths, artists' entrance, &c., appear more economical in the third set, and the objectionable overlapping of private baths over the second swimming-bath is avoided in both the latter sets of plans. In addition to the above fault, we notice that the provision for the introduction and removal of the large boilers is not clear; there does not appear to be any access road enough. The clubroom, which is required to be about 400ft. in area, or 20ft. square, is small; but some competitors have made it a committee or cloak; it is intended to serve both purposes in connection with the hall. The basement lighting, as we have said, is unsatisfactory. It will be said that these faults are counterbalanced by a better public hall and gallery accommodation; yet we cannot altogether see the reasons which have influenced the assessor in determining upon the order of merit. In the second design we have a fairly good plan, granting that the lower level of second large bath can be worked out. One fault we find in the arrangement of the waiting-room entrance to laundry, which makes it about twelve steps above the lobby; this would entail the clothes being brought up and down.

Of the few other designs showing study and a scrupulous attention to the conditions and schedule of accommodation, we may mention No. 26. The author has utilised his front entrance space to the utmost. The main swimming-baths are parallel, as in the three first designs; the lighting and ventilating and acoustic arrangements appear to be well studied. The author prefers an arched ceiling light, with warm air inlet gratings to prevent condensation and to assist ventilation—a very necessary point. The public entrance to large bath is not, however, sufficiently distinct; and is arranged at the side of the main bath entrances in Old Kent-road, with three exits along the side of hall opening into Marlborough-road. One feature in this scheme intended to meet the requirement of the conditions is the introduction of window recesses for seats in the gallery plan, with self-rising seats. These bays form a pleasing breaking up of the wall surface on the Marlborough-road side, and provide an additional row of gallery seats without obstructing the passages ways required. The men's first-class private baths are on the right-hand side of second bath, and form an annex; the ladies' first and second-class on the first floor, while the men's second-class private baths are placed over the mangling-room in the rear, and some behind the swimming-bath. The washhouse and laundry planning and details are a strong feature of the plan. Provision is made for towel-lifts, and the establishment laundry, with its own yard, is placed under the men's first-class private baths; and attention has been given to the working by service corridors, to details of

storage for towels, to the drying-houses and the exhaust flue from them. The boiler-house has been planned to give ample space for the removal and turning of the large Lancashire boilers—a very necessary part of the arrangements which many have neglected. This design shows a good clubroom near the side entrance to large hall; over it is a mess-room. A useful right of way is obtained at the side of the second bath hall, and in line with entrance from Marlborough-road. The basement and Turkish baths are well-lighted from areas and flat-prism lights in the front. The author has generally well considered the details of the scheme, and the elevations in red brick and Portland stone dressings are broadly treated.

No. 9 has a well-devised plan. The baths are placed with the plot, side by side, with good public hall and women's hall, and side entrance to hall and gallery—these are convenient. Near the entrances are cloakrooms and ticket-office. The women's second-class private baths are on the east side, with their first-class in front. The men's second-class private baths approached between washhouse, and swimming-baths are on first floor partly over washhouse and ironing-room, with good entrance from side road, and their first-class baths in front of the second large bath. The planning is compact, and in well-defined blocks, instead of rambling about. There is a good corner staircase to hall and gallery, and the exterior has a plain side and broadly-treated front with English Renaissance features, and a corner tower and cupola accentuate the entrance and staircase. In the washhouse arrangements the author appears to have studied the conditions in an economical way. In No. 8 there are good entrances to men and women's baths, and a public entrance to first-class hall, and the clubroom on right is convenient to it. The men's second-class entrance is between washhouse and large baths, as in the last design. The women's first-class slippers are on right-hand side of second-class swimming-bath, with their first-class slippers in front. On the first floor are the men's double and second slipper-baths over washhouse and ironing-room, and their first-class partly over the end of the second swimming-bath; also women's, which are continued alongside of men's first-class and in front of large bath. This distribution of private baths we find in other plans, and is objectionable on economical grounds. The large number of private baths to be provided (90 for men and 30 for women) of both classes no doubt rendered it difficult to obtain area in one or two parts. No. 21 has many good points, and the author has closely followed the conditions laid down.

The large hall is not placed at the bottom, but there is a space for light between for the establishment laundry, situated in basement. The entrances to public hall, which have not been thoroughly understood by some of the competitors, have in this plan been considered. There is a corridor from Old Kent-road, rather long, and parallel to it another to gallery, with two emergency exits. The slipper-baths are located in front. The washhouse arrangement appears to be well considered; there is an excellent entrance for washers. The boilers are placed so they can be removed, and the lighting arrangements are better than those of many other plans. The Turkish baths are well-lighted by areas in front. No. 27. This design shows a large hall with public entrances—one for swimmers, also one for women, and to their slipper-baths. One gallery exit to large hall is shown in front. On the first floor are the men's private baths facing the front, and their second-class over laundry and washhouse in rear. The women's private baths are well arranged below. There is a well-drawn elevation in red brick with stone dressings, a centre turret springing from a curb roof, and the character of treatment is Georgian.

A few of the designs have their swimming-baths placed crosswise with the site; the advantages of which arrangement are not very obvious, as this principle limits the number of exits from large hall, and the special public entrance has to be placed in Marlborough-road, unless a corridor entrance is made from the Old Kent-road. According to the schedule, special entrances had to be provided for the first-class swimming-bath when in use for entertainments in both streets, but several competitors have only shown one entrance. The queries made by competing architects show that the condition about entrances was not clear to the minds of some of the authors. The answer to the question whether two special entrances are required for the first-class bath in both streets is that "a special main entrance is required in Old Kent-road when the bath is used for entertainments. Another is required in Marlborough-street." No. 33 shows the baths crosswise, with entrance in Old Kent-road and a public one in Marlborough-road. The exits are through the front vestibules. The private baths are arranged over the washhouse, and also in front over the entrances. The elevation lacks unity and cohesion, and the features are rather tawdry. We do not think there are any decided advantages gained by the position of large baths adopted.

Design No. 35 is an elaborate set, displaying considerable study and labour, though the authors place their swimming-baths crosswise, side by side, the object of which is to obtain more spacious public-hall conveniences at the side of large bath; to do which it is proposed to convert second-class bath into a crush-room and ladies' cloakrooms, &c.; but this plan sacrifices the direct external exits on one side, as they are mainly at the Marlborough-road end. The washhouses, &c., are behind, as usual, and men's first-class warm baths in front with side entrance. A forecourt is shown for bicycles. The basement area devoted to the Turkish-bath is large and doubtfully lighted. The first floor are the men's private warm baths, second-class, with their first-class over the men's. The second-class men are partly over the second-class swimming-bath. The elevation in red brick and stone or terracotta; it lacks cohesion in the gables. We find the author very careful in his engineering details. The boiler-house is made high enough to allow any of the large tubular boilers being raised above the top-most fittings. No. 47 has the usual position of large baths side by side, with women's second-class private bath on the east side, and their first-class in front. There is a direct public entrance to bath from Old Kent-road, with side road exits. The laundry and washhouse department behind appears well planned, and between this block and first-class bath is the entrance to second-class private baths. These are partly over laundry and washhouse, and partly in front of the second-class swimming-bath. The artists also use the same side entrance. No. 48 shows the large baths placed parallel and of equal length, and the entrances are good. In No. 50 the swimming-baths are again transverse to site, the front entrances are not satisfactory, and the exits are at right angles. No. 17 has a clever elevation, with corner tower and good points of plan. It is unnecessary to go through other designs that have merit. Many of these exhibit careful thought and study in parts, and excellent draughtsmanship. There are some which have missed the problem, or have made the large hall too wide; others have disposed their private baths in patches all over the area. Many authors show a defiance of the instructions, or have no technical knowledge of the washhouse and laundry requirements and their fittings, and a few are a little over the top, or three have placed themselves out of court by twisting their second swimming-bath to fit

the boundaries of the plot in the rear, as in No. 1, on the other side will go up set; or as in No. 2, and probably No. 6 is a joke.

As we have said, the conditions left much to the discretion, and the queries, which numbered over one hundred, show that there was a lack of clearness in some of them. The questions relating to the special entrances to the first-class bath point to a want of clearness in the original instruction; another important inquiry related to the three tiers of seats in the gallery of large swimming-bath, but this was left to the competitors' discretion. The entrance from Marlborough-road for men to the second-class swimming-bath was not understood, and many other questions were asked and received replies before the plans could be completed.

One question that has apparently involved much uncertainty refers to whether it was permissible to place any of the private bath-rooms on a gallery floor around the upper part of the swimming-bath, and the reply was "Yes, but preferably over the urinals only." The reply precludes the interpretation that such baths could be placed over a considerable area of the swimming-bath, as in the design placed first. Several designs show boxes and galleries occupied by private baths.

PUBLIC BODIES AND ARCHITECTURE.

THE first of two lectures under the Warburton Trust was delivered at Owens College on the 12th inst. by Mr. Reinald Blomfield, whose subject was "Municipal Bodies and Architecture." Mr. Alfred Hopkins, Principal of the college, presided. Mr. Blomfield said he did not propose to offer any suggestion as to the practical business details with which municipal bodies were concerned in relation to architecture. A far more widely-reaching question was the mental attitude of municipal bodies towards architecture, the faculty of judgment which they possessed—or did not possess—as representing the average public. He hoped to show that there was here a growing necessity for wiser and more intelligent education, and to offer some suggestions as to the lines that this education should follow.

THE DUTIES OF MUNICIPALITIES.

Municipal bodies in modern cities had more important functions to discharge in dealing with architecture than anywhere else. The buildings for which they were responsible were public buildings, and therefore were, or should be, monumental in character, with regard to the fact that they were built once and for all, and were of special and permanent uses. For good or for bad, they represented the average public taste and intelligence of the time. It was a reflection that should make the more thoughtful of our public men ponder on their misdoings, with some misgiving that future generations would view their water-logged contempt for the new barracks and masses of vulgarities that had to often done duty for our hospitals and other town-halls. Unkind things were said about modern architecture, all tending to the conclusion that there was no such thing, and that architects had nothing to say. This might or might not be the case, but it was not the fault of the architect. It was the fault of those who employed them. Bodies who too often took a very easy view of their responsibilities, and considering architecture a matter of slight importance, cheerfully treated the selection of their architect as a matter of merely local and ephemeral interest. The attitude of town and county councils to architecture had not sufficiently reflected the attitude of the general public towards it. That this attitude was quite unsatisfactory there could be no doubt. He thought that any competent citizen who took note of the average of architecture in our great cities would be driven to the conclusion that the general level of taste and intelligence was low. He would find that some of the best buildings were the most common. He would find, too, that the standard of construction, but merely a mass of small elements, amounting to little more than individual expressions of like or dislike. He would find, in fact, public opinion in architecture in a state very little removed from chaos. It would find that there was no intelligent body

of opinion to which a competent architect could appeal as a matter of course; and that the public in the pursuit of architecture were like sheep without a shepherd. The uncertainty of taste showed the weakness of the public mind, and the last fifty years was conclusive evidence of the confusion of judgment which existed in the minds of our representative public men. There was no reason in the nature of things why this state of chaos should indefinitely continue.

THE GROWTH OF THE GOTHIC REVIVAL.

It had not always been so in English architecture. In the 14th and 15th, and in the 18th century, when a building was to be erected, such questions as had recently exercised the Liverpool Cathedral committee did not exist. Architects who were called upon to design a building knew exactly what they had to do. They had no necessity to clear the ground by a long preliminary discussion as to the style to be adopted. Everything went as smoothly as clockwork; but about 150 years ago a new element appeared. The amateur and the virtuoso assumed an importance which they had never previously enjoyed. Distinguished noblemen dabbled in design, and eminent men of letters amused themselves with architecture. Mr. Blomfield quoted the example of Horace Walpole, who, he said, subordinated architecture to the elegant idiosyncrasy of his own taste. When a direct attempt was being made to reproduce Gothic architecture, in obedience to a purely literary sentiment, it was hardly to be wondered at, he thought, that the layman should have lost his bearings. Thus the 19th century opened with three styles struggling for ascendancy—the old tradition of classicism of Chambers and his school, the new Greek method, which was to be carried to such a high degree of excellence by Decimus Burton, and lastly by Thomson, of Glasgow; and, lastly, this revived Gothic. All architects of reputation followed one or the other of the first two manners. The amateurs stuck to the Gothic, and the amateurs created the day; but when one considered the whole force of the Romantic movement was behind them, the result was not surprising. So Wyatt, or Wyattville, started his career of architectural murder. Pugin followed, and threw himself into the cause with the enthusiasm of an ill-regulated mind; and then came Ruskin, a man of narrow prejudice but brilliant genius, whose eloquence was a sort of St. Martin's summer for the Gothic movement, prolonging its life quite two generations behind the appointed time. All these men, from Walpole to Ruskin, seemed to have laboured under one very serious vice in their handling of architecture. It never occurred to them that architecture was an art which dealt with practical and immediate necessities, that it was founded on use and not on construction, and that the details which so much exercised their attention—Walpole with his ridiculous Gothic, Ruskin with his exquisite sense of detail, and no more—were not architecture at all, but mere words or phrases in its language. So Walpole treated architecture as a subordinate expression of literature. Pugin, and still more Ruskin, translated it into terms of ethics. The result had been that the sense of architecture as an art, with its own limits, its own technique, and its own ideals, had almost disappeared, even among architects.

ATTITUDE OF THE PUBLIC TOWARDS ARCHITECTURE.

So far as the public was concerned, laymen had first of all lost their bearings in architecture, and finally had lost their interest in it, as being an art of no serious bearing on the immediate concerns of life, and therefore to be dealt with according to the fashion of the time, without regard either to first principles or to the teaching of the past. This habit of mind had been faithfully reflected in the conduct of the various bodies which represented the public. The public competitions for town-halls and similar buildings erected in this country during the last 50 years was too painful to go into. But, with rare and brilliant exceptions, the deplorable results were to be seen in every part of England to this day—in assemblies that disgraced a whole countryside with their deformities and town-halls that brought their cities into disrepute. The public mind, in fact, in these years, had reached the lowest state of vulgarity ever sounded in our country. These fiascos in municipal architecture were a matter of the last fifty years or thereabouts. Before about 1850 public buildings might have been unimaginative and dull, but the majority of them

preserved some glimmering of an architectural sense; they regarded proportion, and were not devoid of a certain staid dignity. But this sort of thing would never do for the historians of the modern revival, and it was not something that knocks you down and then gets you up. It was to be talked about, something that would reproduce well in the art papers. The absurd thing about it was that meanwhile there existed a high degree of individual good taste and culture. The difficulty was to get this knowledge into line and to make its weight felt in the mind of the public. It was not enough to need to instil sounder and simpler views into the man in the street, to make him more anxious and inquisitive about the buildings he had to live with, and to suggest to him larger ideas as to his duty in the matter. It was pretty certain that if the public wanted good architecture and really cared about it to such an extent as to make it a matter of serious interest, they would very soon get it. He thought that there was no lack of ability among the architects of this country; the only thing was that ability did not appear to be wanted. If it were, public bodies would hardly tolerate what they got in some of their public buildings. London, for instance, or the London County Council, would hardly permit such frontages in new streets to be taken up by hideous syndicates and covered by piles of financial buildings which made one long for a second Nero. Important public buildings would not be handed over to mere office draughtsmen of unproved capacity; the care of our cathedrals and great public monuments would not again and again become what was more or less of a public scandal.

THE IMPORTANCE OF EDUCATION.

How were they to get at this state of indifference and to rouse municipalities and public bodies to a sense of their responsibilities? The question became one of education, and it was a question which in a great and intelligent city like Manchester should be seriously considered by its representative public men. Cities such as Manchester were not hampered by the traditions of the older Universities; here, with a new foundation specifically designed to meet modern requirements, there could be no excuse for neglecting to provide for this growing educational need. There seemed to him, broadly speaking, to be three channels through which the public could be reached:—(1) by direct school teaching; (2) by treatises on architecture; (3) by the work of architects themselves. With regard to this latter point, it must be obvious that in an art such as architecture, which must make its appeal through the eye, the object-lesson of a beautiful building was worth all the treatises in the world. But, then, in the first place, the architect must be given the opportunity to design such buildings, and the public must be made to care for them when they were built. Hitherto, and until quite recently, no systematic public education in architecture had been attempted in this country. It had remained outside the lines of general education, and from this point of view had been considered rather as a mere hobby for which no special provision need be made, and as a scholasticism of the modern Universities to remedy this defect, and to organise a system by which, at the great provincial centres, not only technical instruction for the student, but some reasonable education in the nature and history of architecture should be provided for the public. There was not only room, but a growing necessity, for such a system of technical education. The old-fashioned system of articles, though not to be dispensed with, was not entirely satisfactory. His own opinion was that anyone who intended to become an architect should be put through a course of technical training as thorough as possible before he entered an architect's office at all. The means of such training should be provided at the great provincial Universities, and should include not only lectures, but practical training in workshops and laboratories. Moreover, this training should not be confined to architectural students only. It was a well-known fact that the great majority of buildings erected in this country were not designed by architects at all; and it was also a fact that many of the most deplorable and deplorable specimens of their practical knowledge. We should hear a good deal less of buildings tumbling down before they were up, of drains laid the wrong way, and the like, if all builders had to go through a course of good, practical training. Moreover, the speculative builder might avoid some of his worst

inquiries of taste if he had any, even the most rudimentary acquaintance with what had actually been done in architecture. After the technical training was completed the work, of course, must become more or less educational, and it was evident that some highly-trained controlling mind would be necessary to undertake this education in the art of architecture. Such a teacher would indeed have his work cut out for him, for it would be his business to clear the air of mis-conceptions and to lead not only students, but the wider circle of an intelligent public, to a sounder appreciation of the theory and function of architecture.

THE QUESTION OF STYLES—A "RECENT CONTROVERSY."

At this moment the public—that was to say, the average man—did not appreciate or understand architecture. In the first place, there was that old stumbling-block and rock of offence—the question of styles. It was evident from a recent controversy in regard to a great building enterprise that to the lay mind architecture presented itself as a question not of style, but of a style—that was to say, he must be able to label it definitely Gothic, or Classical, or Greek, or Egyptian, or whatever else it might be. This meant that a design should present such a number of familiar features that it would be at once pigeon-holed a Gothic or Classic, because even the layman could see that it reproduced the mouldings or traceries, or the orders and entablatures, which he had picked up from textbooks to be the distinctive features of the style in question. So the layman went his way quite satisfied. He thought that he had got his style according to his prescription, and fancied that he was building as good a Gothic cathedral or Classical temple as ever built in the days of Edward I. or Pericles. But he was not getting a more or less knowable copy; he was getting, not architecture, but archaeological pedantry, and the better it was the worse it was, because so far it divorced architecture more effectively than ever from the actual uses and necessities of life. Such a man. Such a man. Such a man had suggested would make it clear that these styles were merely the classifications of historians, often as amateurs; that they were merely labels of identification dealing with exterior only, and that behind them there was an elusive spirit to be caught—the real meaning of architecture. It would be a great thing once and for all to clear away this initial misconception of architecture; but there were others hardly less formidable. The way out of the present wear was not easy. A century or more of experiment in the arts had brought little but disappointment and disillusion. Perhaps it was in this latter respect that the hope for the future lay. There were not wanting of a half-articulate revolt against the two extremes of architectural desecration—scholasticism on the one hand and commercialism on the other. We must learn to look upon architecture as a living art, not "complete and exhausted," as a distinguished critic made bold to say the other day. In the way of development waiting to be found, not less varied than in the happy days when architecture was a vital force.

Mr. Blomfield was thanked for his address on the motion of Mr. Alfred Darbyshire (President of the Manchester Society of Architects), seconded by Professor Trow. Professor Trow said that he hoped to sound a chair in architecture at Owens College in the near future. It might be asked why there was not already such a chair in existence; but the reason was that the funds of the College were not adequate at the present moment for this new venture. If they could only get a little more to start with, they would be best to found the chair and to get the right man to fill it.

Mr. Blomfield, in responding to the vote of thanks, said the establishment of a school of architecture at Owens College would meet a very great need, and he wished Manchester all success in the enterprise.

THE ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of the Association was held on Friday evening at 9, Conduit-street, W. In the absence of the President and Vice-Presidents, Mr. R. S. Balfour, Hon. Secretary, was called to the chair. Mr. Edward Cooper was elected as a member, and two nominations for membership were read. The CHAIRMAN

announced the following additional donations to the New Princes Fund:—Messrs. Ernest George and Yates £50, Mr. A. W. Soames, M.P., £25, Mr. Edwin T. Hall £20, Mr. B. T. Batford £10 10s., the Executors of the late T. Satchell £10 10s., Mr. Herbert A. Satchell £10 10s., Mr. W. A. Pile £10 10s., Mr. Edward M. Gibbs £10, Captain W. B. Marling £10, the Hon. A. W. McCall-Hogg £5, Mr. C. B. Bone £3 3s., Mr. H. H. Weymouth £3 3s., Mr. W. H. Raffles £2 2s., Mr. G. L. T. Sharp £2 2s., Mr. P. J. Turner £1 ls. There was an addition since their meeting a fortnight previously of £145 13s., making a grand total of £2,513 13s. 6d. It was then announced that at the meeting of the Discussion Section on Friday, December 20 (to-night), a paper would be read by Mr. H. HOWARD HEMPENY on "The Manufacture, Testing, and Uses of Portland Cement."

TRAVELLING STUDENT'S NOTES ON OXFORD.

A paper bearing this title had been announced to be read by Mr. J. E. FORBES, the winner of the A.A. Travelling Studentship last year; but he was unable to attend, having to appear as a plaintiff and witness in a libel action in course of trial at Birmingham Assizes and reported in another column; he forwarded his paper, which was read by Mr. J. D. TATE. Mr. Forbes wrote that he thought it unnecessary to describe the colleges and buildings of Oxford, as they were well known to all members. He therefore confined himself to some observations on the legends, origin, and early history of the city. The town of Fredeburg was recounted at considerable length, and the habits and customs of the Varsity students in past years were described in detail, the paper being throughout of a character without interest or instruction to our readers. No studentship drawings were exhibited, but the close society coloured lantern slides of Oxford and its colleges were thrown on the screen without note or comment beyond the titles of the subjects, work by Scott, Butterfield, Bodley, and Jackson being passed over uncriticised and unappreciated.

A formal vote of thanks was passed to Messrs. Forbes and Tate on the motion of Mr. N. F. BURNETT, seconded by Mr. W. J. H. LEVISTON. In putting it to the meeting, the CHAIRMAN said he must say he was not quite in sympathy with the line taken by Mr. Forbes in the preparation of his paper. He had expected that one who had gained the Travelling Studentship would have possessed personal note into his remarks, and he much regretted that Mr. Forbes had not taken the members more into his confidence as to the details of his work. He thought Mr. Forbes had confessed himself unservant, or had been so excessively modest as to deny himself the privilege of availing himself of his own knowledge. The members of the committee and the audience shared in his disappointment and in the views he had just expressed.

NOTES FROM EDINBURGH.

THE alterations, which for so many years have been in progress at the east end of Princes-street, are within sight of the completion, and the construction, occasioned by a strike, will not likely much exceed the limit of the period assigned for works designed on such an extensive scale. This part of the city has been more or less in a state of uncomfortable desolation since the outbreak of the strike, but now there remains only the hoarding in North Bridge-street on the west. The east side has for some months been opened for business, and is, with its range of lofty and spacious shops, the best sample of street architecture in the business portions of the city. Their western portion is well represented in the new building at the north part, including a portion in Market-street, the thoroughfare, at lower level. The enlargement of the Waverley Station does not show much more than a vast stretch of rather dirty glass, as visible from the vicinity. But if this aspect of the undertaking is to be judged on more than its artistic point of view, there is no compensation in the stately building of the adjoining hotel, which is an integral part of the N.B.R. scheme for improvement of the station.

No more notable addition has been made to the landscape of the city, and the inferior character of its isolated site, magnitude, and elegant design make it a most imposing edifice. The

scaffolding has been removed, and the mason work completed, though the interior of the hotel is and will be for long under the hands of the tradesmen. The floors are laid, and with the fire-proof concrete designed by Stewart and Co., so that the internal finishing can go steadily and quickly forward. The site is nearly a square, about 100ft. by 120ft. There are four floors above street-level to the cornice, and two main attic floors above that, which is the usual Classic cornice of deep projection. The length and breadth and height are thus apparently very much alike. Adjoining buildings look in comparison like a child's play, and it is better keeping with the lofty and extensive frontages at the other end of the bridge. The other notable edifices, the Register Office, Post-office, and the Ionic porticoes which form the western elevations of Waterloo-place, have ample grounds for holding their own as representative of the best architecture of their time. The Register House gives the architecture, of elegant proportion without much ornamental detail. The colour or decoration of Waterloo-place and Post-office do not suffer from comparison with the contrast, presented by a style in which variety of detail is required to relieve the monotony of a design with many floors.

The composition is simple and effective. Each elevation is made of three divisions, although there is somewhat less of detail on the east side. These divisions are marked by slight pilaster projections, and are more conspicuously apparent above the cornice, where the four extremities are roofed with four-sided domes in stone, and the central bay with a dome in gable and a pediment on the roof. On the north or Princes-street side, in place of this gable a lofty clock tower is substituted, which stands out conspicuously against the sky, and groups well with the Scott Monument spire, and the buildings of the Calton Hill. The three divisions, above mentioned, are marked also by shallow segmental projections with oval windows, and at the cornice a somewhat novel and striking feature has been introduced in the form of sharp octagonal turrets with open crowns in stone. Above the cornice are the attic windows, with ornamental gables, which conceal a great proportion of the main roof, shattering entirely the line of the cornice. The roof is constructed in a creamy white freestone. There is no meaningless sculpture on the wall surface, so that the more crowded and elaborate detail at and above the cornice tells with a good effect. If something must be said in accord with the unexceptionable maxim that there is nothing better than a weak point of view—reception might be taken to the overloading the dome gables with ornamental details, which mar the outline. The pyramidal domes also are too low, or rather lost to view, and almost buried by the domes, gables, and ornamental turrets. A more simple outline—a domed gable, and a little projecting over the dome, would relieve the design of the apparent confusion of details which, at a little distance, appear to be characteristic of the elevations above the cornice level at the west end of Princes-street. The elevations of the Caltonian Railway Station and Hotel are very notable in comparison. The building is conspicuous for its extended frontage, which is lofty, and so forms a good screen for the railway sheds behind it. Its upper windows command an extensive view of Princes-street and its gardens, with the old town and castle rock, and the Calton hill in the distance. It is a most dignified business-like edifice, but without any attempt to give the picturesque variety for which the N.B.R. edifice is so conspicuous. The entrance front is stately, with its three lofty and spacious archways, and balcony with its four guardian statues seated comfortably at the wall above, each looking down commanding in a wide and lofty gable, which, with its two floors, is the same as the principal feature, breaking the uniformity of the roof on the two other sides. The building in the Lothian-road or east side is of great length, and from some distance has rather too much the appearance of an uncompleted building.

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Four-inch Soil-pipe of 7lb. Lead, with Collars, Joints, and Flange.—This is the usual size and weight specified for a soil-pipe. A 4in. diam. pipe is rather more than a foot in girth, and so the weight would be 7½lb. per foot run, to which add 1½lb. for racks and solder, or 9lb. total. (See weights in Memoranda.) Soil-pipe costs about 1s. per cwt. more than sheet lead, or 2½s. less 15 per cent. discount, equals 20s. 5d. per cwt.

1½cwt. mill-drawn lead pipe and racks at 20s. 5d. 1 8
1 hour fixing, including solder, &c. 1 0

2 8
Add 10 per cent. profit 0 3
Cost per foot run 2 11

Extra for Bonds in ditto.—This is labour and solder only, the bonds being already measured in the length of pipe.

Labour, three hours plumber 11d., and mate 7d. s. d.
at 1s. 6d. 4 6
1½lb. solder at 5d. 1 0
Fuel, &c., say 0 3

Add 10 per cent. profit 0 7
Cost of each 6 4

Extra for Soldered Joints in ditto.—These are worth 3s. or 3s. 6d. each for labour, solder, and profit.

Soldered Joint to 1½in. Lead Pipe.—This is made up as follows, but the amount of solder will vary with the workman. (See Memoranda.)

s. d.
1½lb. solder at 5d. 1 2
Half-hour plumber and mate at 11d. and 7d. 0 9
Fuel, &c., say 0 2

Add profit 1 11
Cost of each 2 2

Boyle's Air-pump Ventilator, 8in. diam., for 4in. soil-pipe, and fitting. Design No. 227.

s. d.
Cost of 8in. ventilator 10 10
Four hours plumber at 11d. 3 8

Add profit 14 2
1 5
Cost of each 15 7

Connection of Soil-pipe with Drain.—As a simple connection without bend or brass collar, this would include a lead flange out of 7½lb. lead, soldered to 4in. pipe fitted to socket of drain-pipe, and sealed with cement. This flange or collar is for the purpose of thickening the pipe where it joins the drain. If the collar is 1ft. long it would be about 1sq.ft. in area.

s. d.
Lead flange out of 7½lb. lead 1 6
Labour and solder 2 0
Making good in cement 1 0

Add profit 4 0
0 5
Cost of each 4 5

Drain Lead Traps.—8½lb. lead is used in these. One soldered joint is taken. For amount of solder see Memoranda.

s. d.
2in. trap. Cost of 2in. trap, with brass screw plug 4 6
One joint, 2½lb. solder at 5d. 1 6
One hour plumber and mate at 11d. and 7d. 1 6
Fuel, &c., say 0 1

Add profit 0 9
Cost of each 8 6

s. d.
4in. trap. Cost of 4in. siphon trap, 8½lb. lead 9 0
1 joint, 4½lb. solder at 5d. 3 0
1 hour plumber and mate at 11d. and 7d. 1 6
Fuel, &c., say 0 2

Add profit 13 8
1 4
Cost of each 15 0

Plumber's fittings and brasswork comprise a large variety of articles, and can only be priced by referring to the illustrated catalogues and price lists of well-known manufacturers. But the labour in fixing, soldering, &c., is not so easily found, as the time required by a plumber and his mate is seldom uniform. The analysis is simple and easy enough, however, and it is only necessary to give a few examples. The difference between good and cheap plumbing is very great, and lighter weights can be easily substituted for the heavy ones specified.

2in. *Butty Washer, Plug, and Chain*, with

perforated bottom, screw shank, and fixing complete.

Washer and waste, with chain and grating s. d.
1 joint, 4½lb. solder at 5d. 2 2
Fuel, &c., say 0 1
1 hour plumber and mate at 11d. and 7d. 1 6

Add profit 5 3
0 6
Cost of each 5 9

4in. *Brass Screw-Down Bib-Cock*, screwed for iron pipe, and fixed. Farnillo's price is 4s., and there is the joint.

s. d.
Cost of ½in. cock, with screwed end 4 0
1½lb. solder at 5d. 1 0
1 hour plumber and mate at 11d. and 7d. 0 9

Add profit 5 1
0 7
Cost of each 5 8

4in. *Brass Screw Union*, or connector, with flynut for iron or slate cistern, and joint to lead-pipe.

s. d.
Cost of ½in. union 1 9
1½lb. solder at 5d. 0 8
Fuel, &c., say 0 0
1 hour plumber and mate at 11d. and 7d. 0 4

Add profit 3 0
0 4
Cost of each 3 4

Connection with Company's Main.—Allow for making connection with water company's main, including ½in. brass screw ferrule, soldered joint, opening and making good road, fees, &c. This is an item that can only be satisfactorily priced out by knowing the site and the district company's fees, and if any length of pipe is required to connect with main. The charge by the West Midlands Company is about 15s. for opening the ground, providing ferrule, and fixing it. This is a very moderate one, the New River charging much higher. The following is an imaginary typical case.

s. d.
Company's fee 15 0
Brass ferrule 1 6
Soldered joint to ½in. lead pipe 1 0
Opening and making good road, half a day's labour, or 5 hours labourer at 6d. 2 6

Add profit 20 0
2 0
Total cost 22 0

(To be continued.)

HAMMERED IRONWORK.*

IT is certain that no smith can be called a good one unless he possesses that artistic intuition, that natural talent with which every art-worker ought to be endowed. The boldness, the finish, and the beauty of his work are hatched to a great extent on that inborn skill—that natural cleverness which experience alone, even combined with continuous practice, cannot give to those who do not possess it. As, however, many great men have held that genius is, after all, nothing else but the power of steady application to the one object which they had determined to master, much can be done by closely studying the various elements which combine to make up the science of art metalwork. They are the following:—Designing, knowledge of material and tools, practical skill in the various branches of the smith's work, which are: forging, welding, embossing, mounting, and finishing. In speaking of design I do not intend to dwell on the subject of the history of art metal-work, as this would bring me to the almost inexhaustible subject of styles and periods, which has been treated by infinitely more competent speakers and writers than I am. I will only say that the main object in designing wrought-iron work is to obtain a pleasing original effect by means of graceful lines and curves, coupled with practical knowledge of construction which tends to produce an artistic object without superfluous expenditure. And you will, I hope, agree with me when I say that hardly any other material lends itself so well to absolute freedom of treatment in the interpretation of elegant and yet simple ideas. Even in England, where so confidently has taken the lead in sound ideas on artistic taste, the time is not very long past where such toy things as imita-

tion roses, spider webs, lizards, and many other naturalistic copious iron found great favour with the so-called "art-loving" public. The much-abused "art nouveau," the "modern style," may have on its conscience a great deal that is unpleasant to the truly æsthetic; but surely it has the invaluable merit of having given the death-blow to all those weak and childish reproductions. The 19th century, with its astounding display of energy, is surely none the less to be respected from an artistic point of view for having endeavoured to endow the future with an art which answers our reformed tastes and requirements, and the origin of this surprisingly sudden movement seems to be found in the complete transformation of the whole machinery of production. The development of mechanical science during the past century has forced us to create certain objects, the want of which had not made itself felt before. But just as in no previous centuries the transformation to entirely new art principles, even under the guiding influence of the greatest reformers, has been quite abrupt, so also now we find in the architecture of the most modern objects many lines which had already previously been employed, and which bear witness to the everlasting and real power of all that has been created by the great artists of old. We only wish to discard the pedantic attention to superfluous ornamentation, and seek beauty in rational application and treatment of the material.

In my business experience I have noticed with much pleasure that of late years the demand for the so-called "armour-bright" ironwork has greatly increased, because this is the finish which, in the measure in which it leaves visible all the special features of the various processes of hammering, welding, embossing, and so forth, shows the natural beauties of the material—viz., iron, to best advantage. Black iron stands next for artistic merit, but this black colour which is obtained either through burning oil on to it or through painting it with "dull Berlin ivory black," is really like painting iron with various colours of gilding, bronzing, &c., a makeshift necessitated through the tendency of iron to rust when left unprotected. I have recently heard of a process whereby iron is said to be efficiently painted against rust by means of a metallic coating, which in no way changes the natural grey colour of armour-bright iron, and it is sincerely to be hoped that this is not merely the delusion of a sanguine inventor's scheming brain. As regards the architect's position in the matter of designs of art metalwork, I hope you will pardon my saying that I have not found these always quite practical. Junctions are frequently shown where it is impossible for a smith to weld, which induces pinning or riveting, neither of which is satisfactory to the conscientious smith. One of the great charms of Medieval ironwork is the absence of fastened treatment, and this which raises the controversy as to who made the designs for these works—the architect or the smith? With all the varied duties and sometimes heavy anxieties which the architect has to bear, I should say that he will very often be glad to leave the task of carrying out the design of the art metalwork in the hands of the specialist. Let us now proceed to the next section of our programme—knowledge of material. When you enter the smithy and you see the worker strike the piece of iron, you are put at once before the problem why the piece of iron is so hard to be worked, and why the hammer which deals the blow nor the anvil which receives the blow, all of which appear to be and, as I shall show you, actually are made of the same material. You will say this is not correct: the one is iron and the latter two are steel. Nevertheless, both are composed of the same one, how gradual is the transition from one material to the other. Which, then, are the important distinguishing features between the two? Iron, such as is alone suitable for our work, is soft. It can be hammered into all shapes, it can be flattened out, it can be swelled by the so-called process of "drawing," it can be bent at sharp angles without breaking, and it assumes a pasty condition under the influence of great heat. This fact allows of uniting two separate pieces in such a manner that they become practically one, and this process,

which is so important for our work, is called welding. When heated, no matter to what degree, and suddenly cooled off in cold water, it does not change its properties perceptibly. Steel, on the other hand, is hard, breaks when bent at a sharp angle, becomes brittle when heated, and when cooled off, becomes a rusty condition, and cannot therefore be welded. Its most remarkable property, however, shows itself when it is heated and then suddenly cooled off. In this case it becomes harder than glass, and just as brittle: when still more heated it loses all cohesion, so that small pieces detach under the slightest shock. As you can see, steel in this state would be quite useless for tools, but it can be treated in such a way as to preserve a sharp edge or point even when used with great force on material as hard as iron or ordinary steel. This treatment is called tempering, and it consists in heating the steel to a certain degree which is judged by the colour it gradually assumes in the fire from brown to light red, and then suddenly cooling off in cold water. From this brittle condition it must be changed into a state of hardness or ductility according to the different purposes it is to serve. This is done by slightly reheating the material. It would be very difficult, if not impossible, to determine when the right degree of heat has been reached. Nature has not provided any wonderful phenomena indicating this change. On a polished surface which has been prepared for the purpose of more easily watching this phenomenon, during the process of reheating appear in succession the following colours:—Straw colour, dark yellow, light brown, dark brown, purple, dark blue, light blue, light grey. —Straw colour gives the work with the hardness required for sharp tools which serve for working metal, for instance, punches, chisels, drills—this stage is still rather brittle: the brown colour accompanies the hardness sufficient for sharp wood-working tools or blunt tools destined for treating metal, such as the anvil and the hammer: blue comes into consideration only for articles which must be very pliable—all springs are tempered to that degree. The remaining two colours and the whole range of colours which during further heating lay over the surface in rapid succession are of little interest, as the material is approaching its original state. Having spoken of the material of which the tools are made, I will not detain you with the detailed descriptions of those most used by the smith, but I will merely state that a conscientious smith will avail himself as much as possible of the aid of mechanical appliances, and confine himself to the use of the patriarchal anvil, hammer, and tongs: the swage block, of which I have shown you a specimen, seems, however, to be a permissible addition to the smith's stock-in-trade. I can now do just what the various operations to be performed by the smith. The first is forging. It is best done when the material is heated to a light red; smaller pieces are forged by one man, larger ones require one or more helpers, who then strike in rhythmic succession. Through knocking the piece against the anvil or through a few light strokes of the hammer, the glowing iron is freed from scale which otherwise would be hammered into the piece. If the latter is to become hard and elastic then the forging is to be continued until the piece becomes cold, or hammer and anvil are wetted, whereby a smooth surface is obtained. Pieces that have become too hard must be annealed, that is, heated to a dark red and gradually cooled down. The second operation is joining of two separate pieces into one is done when both are at a white heat. It is important that the smith should know exactly how to prepare his fire in order to heat his pieces, first in the right places, and second to the right degree of heat, because the result depends on these two points. As you can see, so that when the moment of welding has arrived he presents to the anvil two pieces of iron which are of the right heat, and yet perfectly sound, which means not burnt. At first sight these conditions appear simple enough, and yet more than one smith whom one might ask whether he can guarantee his welding at the first attempt would, at the critical moment where his labour and piece are at stake, reply in the negative. The man is seized with a fear of all the possible accidents, but this fear, instead of diminishing his facilities, gives him on the contrary an energy, a dexterity, a presence in the strike of his hammer which his ordinary strength and have with some-few. For he knows that he is dealing with a generally not to be trusted material, and that any compromising

the result—maybe of days of difficult and always conscientious work. All these emotions through which he has to pass cause him to become passionate for his craft and to talk of it with pride. The points which the experienced worker will observe in order to prevent failure are the more intense intensity of the fire, which are best regulated by having a sufficient quantity of so-called "breeze" (breeze is coke from which less gas has been extracted than from ordinary coke, and it is washed three times in order to remove all dust and earthy substance which would cling to the iron and thus spoil the work) handy wherewith to replenish the fire, making it more intense than ordinary coke, and allowing the iron to be evenly heated right through without burning it; then he will take care to prevent the blast or draught coming into direct contact with the pieces to be welded, as this would paralyse the action of the fire. He will turn round his iron often enough to protect it from being burnt, and each time he turns it he will sprinkle it with a little sand, which protects the outside of the piece from burning and helps the piece getting evenly heated. The stretching is synonymous with the lengthening or widening of the piece of iron to be treated. The strokes with the thin end of the hammer are more efficient than those with the broad end. The jumping is the opposite process, and produces a shortening and thickening of the piece. It is done by lifting and then heavily dropping the piece on to the anvil or on to a special jumping block, or by striking one end of the piece with a hammer, whereby that portion of the iron which has been made red hot is swelled. The adjusting gives to bent pieces or to those which have got out of their angle the right shape. It is done with the hammer on the anvil, or on the "adjusting-plate," and can be done hot or cold. The bending can also be done while the iron is hot or cold. If the piece has to be bent in an angle of 90° it is hammered over the sharp-edged bank of the anvil; if it is to be round, the circular end of the bank is made use of. The embossing or "repoussé" work gives to thin metal all sorts of plastic forms destined to enrich the heavier forged parts. It is done either hot or cold, the latter being preferable for the working of delicate details. Light hammers of a great variety of shapes, either with ball-shaped or edge-like faces, are employed for this work. Great experience is required to judge of the allowance to be made for reducing the flat surfaces into curved and hollow shapes.

The lecturer concluded with several practical demonstrations given by Mr. Ashford.

A 163FT. CONCRETE-STEEL CHIMNEY.

A CHIMNEY of concrete-steel construction A.J. has recently been completed in Jersey City, N.J. It is built according to the Ransome system, which employs cold-twisted square steel bars to reinforce the concrete, and it has a constant inside diameter of 8ft., included in a double shell, the two parts of which are at their common base 7in. and 4in. thick respectively. The stack forms part of a plant which the Central Lard Company of New York, is erecting at Seventeenth and Cole streets, and for which Mr. Henry Floy, of New York, is the engineer. It was built by the Morris Building Company, of New York.

The chimney is supported on a concrete-steel base or footing on the top of long piles. The shaft proper is 8ft. below the grade line to the base, which is 4ft. 6in. deep, its upper part, as indicated in the accompanying drawings, being sloped off to form a truncated cone. The cone on which the plant is being erected is an extremely marshy one, and has to be filled in some 10ft., or 11ft., to bring it to a chosen grade line. The piles are driven 8ft. below the grade line to the base, which is about 58ft. with a corresponding finished grade level. They are of yellow pine 14in. to 18in. in diameter, and over the area of the chimney footing, which is 21ft. in diameter, 56 were driven, one pile, therefore, to about 88sq. ft. of footing area. The tops of the piles are imbedded 18in. in the concrete; in addition to these are driven 4in. to the piling of the powerhouse foundation, as shown in the accompanying cut, a 2in. rod extending from each of two straining blocks to a pile in the foundation of the powerhouse.

The arrangement of the chimney piles is shown in an accompanying drawing. They are placed symmetrically with respect to two axes through the centre of the foundation, one parallel with the

adjacent side of the powerhouse and the other perpendicular to it, and are arranged in lines parallel with this wall, for convenience in driving. These lines are so located and the piles spaced along them in such a way that the greater number per unit area are located around the outside of the foundation, where the stresses due to wind moments are greatest.

The concrete footing proper contains about 56 cubic yards of concrete, and is reinforced by four layers of twisted bars above the piles and by two twisted bars which are welded into two rings imbedded in the concrete around the outside of the piles. These bars are all 3in. square bars cold twisted. Each of the four layers consists of 18 bars, spaced about 10in. apart, those of each layer running in one of four directions, as indicated in the accompanying drawings.

The reinforcement of the shaft of the chimney consists of continuous vertical twisted bars, spaced around in both the outer and inner shells, and successive horizontal rings of twisted steel in both the outer and inner shells. The vertical bars in the outer shell are of 3in. square steel, 30 in number, and those in the inner shell are of 3in. square steel, eight in number; the former



are thus spaced about 13in. apart, while the latter are about 35in. apart. The rings in the outer shell are of 3in. square steel; those in the inner shell of 3in. steel; in the former case, the rings are 2ft. 6in. one above the other, contra to centre; in the latter, they are half that distance apart, making twice the number of rings. The rings are located outside the vertical bars. The smoke breaching connection and clean-out door are shown, together with the details of steel reinforcement for these openings.

The double shell construction, it will be noticed, begins at grade level, below which the shaft rises from the concrete footing in a single shaft 20in. thick, filled in the interior with large stones. The outer shell has eight ribs spaced around on the inside, extending from the bottom of the stack to the top, and the inner shell has an equal number on its outside, directly opposite those of the outer shell, leaving about 24in. clearance. The ribs, as shown in the sections, form eight cores: these have a 14in. vent at the bottom in each case and at the top of the chimney are open with the interior, the inner shell having a vertical clearance of 5in., in which expansion changes may take place. The top of the chimney is ornamental, as shown in the accompanying reproduction of a photograph of the structure, and it is fitted with four lightning rods, tipped with copper on top, made continuous with four of the vertical steel twisted rods and grounded below the

OBITUARY.

MR. HUGH LIGNARD, F.S.A., M.Inst.C.E., Hon. Assistant R.I.B.A., late chief engineer of Bengal Presidency, died on Saturday last at his residence, 7, Holloway-road, W., aged 78 years. Mr. Lignard spent a long and useful career in the Public Works Department of India, from which he retired on attaining the age of 65 years, and returned to England. He was one of the earlier Honorary Associates of the Royal Institute of British Architects, having been elected in 1878, and frequently attended its meetings and occasionally joined in discussions. The funeral took place at St. George's Cemetery, Hanwell, yesterday (Thursday).

Mrs. EDWARD WILLIAM SMITH, M.R.A.S., archaeological surveyor to the Government of India for the North-West Provinces and Oudh Circle, and Keeper of the Museum at Lucknow, died on the 21st of November of cholera in the house of E. Harriett, Oudh. He was elected an Hon. Associate of the Royal Institute of British Architects last year.

CHIPS.

Mr. Edmund Boulton, M.P. (Mayor of Marylebone), on Wednesday night, in the large hall of the Polytechnic, Regent-street, distributed the prizes and certificates won during the last year by the students of the Architectural and Mechanical Engineering classes. Mr. T. Blashill occupied the chair. Mr. Robert Melli, Director of Education of the Institution, said that in the recent examinations at the Royal Academy, four out of seven silver medals for architecture had been won by students of the Polytechnic.

Mr. William Hughes, the well-known artist, whose pictures of fruit and flowers have so often been exhibited in the Royal Academy, died on Wednesday at his residence in Brighton.

The authorities of the City of London College have received an offer of £15,000 from the trustees of Mitchell's City of London Charities, conditional upon another £10,000 being raised to complete the fund necessary for putting into operation the scheme of development already decided upon. The scheme is so far forward that the premises in Ropemaker-street adjoining the existing building have been secured.

The contract for a portion of the superstructure of the New York Custom House has been awarded to the United States Treasury Department by John Pierce, with a provisional acceptance of his bid for the remainder of the building, conditional on the making of an appropriation by Congress for the purpose.

It was officially announced on Wednesday that the number of Bills deposited in the office of the clerk of the Parliament, House of Lords, for the ensuing session, up to Tuesday night, which is the latest time for making such deposits, was 220, as compared with 255 lodged at the corresponding time last year in the corresponding session of 1901. The deposits made are in respect of local Bills proposed to be introduced into either House in the ensuing Session.

To perpetuate the memory of the late vicar of Aylesbury, Bucks (the Rev H. McNair), the chancel of the parish church is to be paneled in oak with painted figures of the vicar, wall, all round the sanctuary. This work, together with the provision of two brass candleabra, will cost upwards of £400, and is to be defrayed by the late vicar's widow and brother.

Mr. Percer M. Stewart has been appointed superintending architect of buildings for the Borough of Manhattan, New York City, under the administration of John Aiken, will enter office January 1, and Mr. William Martin Aiken has been appointed consulting architect of the borough. Mr. Stewart has been engaged in building as a bureau for several years. Mr. Aiken was not long ago supervising architect of the Treasury Department at Washington, prior to which time he was engaged in the practice of architecture at Cincinnati.

The German Emperor and Empress witnessed at Berlin on Wednesday the unveiling of the statue of Johann Georg, seventh Elector of Brandenburg (1571-1608). The statue, with the busts of two distinguished contemporaries of the Elector, forms the last of the 32 marble groups some years ago presented by the Emperor to the city of Berlin and destined, in his own words, "to be the monument of the development of the national history from the foundation of the Mark of Brandenburg to the establishment of the Empire." The busts on either side of the central figure represent, respectively, Johann Dietelmeyer, the Chancellor of Johann Georg, a famous jurist, and Kochus, Count von Lynar, an Italian architect, who built for the Elector the stadel of Spandau.

Building Intelligence.

BURY, LANCs.—A new market hall, which has been erected by the Bury Corporation at a cost of £14,500, was formally opened on Friday by the mayor of the borough. The hall is situated at the junction of Market-street and Moss-lane, and supercedes an old market which has stood for over sixty years on an adjoining site. This old market was built in 1830 by the then Earl of Derby, and existed without a roof until 1867. The roof provided in that year has lately threatened to become a danger to the stallholders and their customers. The new market covers a superficial area of about 30,000 ft., and is so planned as to be capable of easy extension by the addition of bays to the south. There are provided 100 stalls, 19 shops, and five fishshops. The shops are placed round three sides of the building; at the Market-street side is the fish market, containing five large shops, and connected with the general market by swing-doors. The central hall extends across the angle formed by the junction of Market-street and Moss-lane, and is approached by a wide central entrance and side entrances. Behind the hall is a covered space for the reception and storage of packages and cases belonging to the tenants. The interior walls are glazed to a height of 6 ft., and above this are of plastic brick. The roof is of iron construction, and is covered with varnished pitch-pine boards and Welsh slates. The fronts are Classic in character, and the central entrance is flanked by columns and heavily-keyed arch, is surmounted by a large octagon dome. The hall is lighted by intensified gas, which is expected to be more economical than the electric light. Messrs. I. Neill and Sons, of Manchester, were the builders.

COLCHESTER.—The new town-hall for Colchester, just completed, will be opened for inspection by Press representatives on Monday and Tuesday next. It has been built from plans by Mr. John Belcher A.R.A., of Liverpool-square, W., selected in open competition, the contractors being Messrs. Kirtledge and Shaw, of Cambridge. It replaces a town-hall erected in 1841 on part of the same commanding site at the junction of the High-street and West Stockwell-street, and adjoining the Corn Exchange. The town-hall has been enriched by many special gifts, the principal ones being the lofty and effective Victorian tower at the angle of the two streets, which was presented by Alderman James Paxman, C.E., at a cost of £2,500; the clock and chimies in the tower, and the organ in the north hall, the latter the donation of Sir Weetman D. Pearson, M.P. The town-hall, which has cost about £16,000, was illustrated from Mr. Belcher's designs by perspective and plan of ground floor in our issue of Feb. 9, 1900.

EUSTON-ROAD, N.W.—Mr. J. D. Gilbert, chairman of the Fire Brigade Committee of the London County Council, laid, on Saturday afternoon, a memorial-stone at the new fire-station which is in course of erection in Euston-road. As far back as July, 1894, the committee recognised the need for the station, which was to be erected on the site of the old Police-barracks. Negotiations were commenced in 1898 for the purchase of the present site, which is directly opposite St. Pancras Church, but they were not concluded until last year. The land has cost £7,700, and the contract for building amounts to £14,377. The builders are Messrs. Simpson and Co., and the work is being carried out from plans prepared by the architect of the supervising architect to the County Council, Mr. F. E. Riley. The new station is to be faced with Portland stone and red brick. Provision will be made for the third officer's quarters and quarters for the station officer, seven married men, coachman, and single men, and there is to be a large recreation-room. A long wall will be constructed for six horses, and the engine-room will be 30 ft. by 35 ft., with space for a horse escape, steam-engine, and hose-cart.

LONDON COUNTY COUNCIL.—At Tuesday's meeting of the Council, the Housing Committee recommended the erection in Mill-lane, Deptford, of a men's lodging-house, on the same lines as those already erected by Lord Rowton, and which would provide accommodation for 804 lodgers. The charge-room will be 6d. per night. The committee stated that throughout the preparation of the plans they had had the advantage of the advice and assistance of Lord Rowton. The cost of the building will be £49,287 15s., and it was recommended that the architect's estimate of this

amount be referred to the manager of the works department to carry out the building. Sir J. D. Poynder, M.P., moved, as an amendment, "That the work of erecting the house be done under contract, and that tenders be invited for the execution of the work." A long discussion ensued, and eventually by 84 to 28 votes the amendment was rejected, and the committee's report adopted. The half-yearly return of the Works Department showed that 21 jobs, estimated to cost £103,620 16s. 2d., had actually cost £118,162 5s., leaving a balance of cost above estimate of £16,976 6s. This was largely accounted for by the fact that the North Woolwich drainage works, estimated to cost £17,683 17s. 6d., had totalled £20,000. Another return showed that the final estimate of all the work undertaken by the department since its establishment amounted to £1,260,092 13s. 4d., and that the actual cost was £1,338,937 10s. 10d., giving a cost above final estimate of £78,811 16s. 6d.

LONDON SCHOOL BOARD.—The annual report of this authority for the twelve months ended March 25 last, published this week, shows that the operations of the Works Committee continue on an extensive scale. During the year six new schools were opened. These have been erected in Chelsea, Greenwich, East and West Lambeth, and Marylebone, and one of them has been transferred to the new Penge School Board. The six schools accommodate 5,323 children, and they have cost, including sites, £171,473, or an average of £32 3s. 8d. per head. The enlargements to nine schools in Chelsea, Finsbury, West Lambeth, Marylebone, and Southwark have provided 2,160 places at a cost of £24,262. Under the London Government Act, 1899, the Board transferred two schools, including one already mentioned, to the Penge Board, and took over a school erected by the Hounsey Board. During the year the Board accepted tenders for the erection of eight new schools in Chelsea, Greenwich, Hackney, West Lambeth, Marylebone, Tower Hamlets, and Westminster. The additional places to be provided in these will be 7,430, at a cost of £212,519, or £27 10s. 1d. per head, inclusive in one case of a gymnasium with dressing-rooms, a physical laboratory, lecture-room, drawing-class room, clay-modelling room, needlework room, store-rooms for chemicals, two teachers' rooms, and a music room. Tenders for enlarging ten schools were also accepted for enlarging ten schools to give additional accommodation for 2,577 children, at a cost of £74,909, or an average cost of £16 10s. 3d. per head; and tenders for other works to schools were accepted, those for drainage and sanitary works in respect of 15 schools amounting to £10,750. In all, 175 additional work in hand consisted of 18 new schools, giving accommodation for 16,966 children, and 11 enlargements, providing 3,629 extra places. Thirty-one additional sites for new schools had been or were being purchased, the schools to be erected on 22 of which would accommodate 17,758 children. Fourteen new sites for schools to accommodate 4,150 children were scheduled in 1900-1901. 22 enlargements of schools were sanctioned for which tenders were accepted, and these would supply 6,555 additional places; while 1,200 more places would be provided in three districts where the Board of Education had sanctioned the acquisition of sites.

MAIDSTONE.—The corporation installation of the electric light was formally inaugurated yesterday (Thursday). The town council adopted a few years ago a scheme prepared by Messrs. Stevens and Barker, electrical engineers, of Maidstone, for the erection of a system of electric lighting by the borough surveyor, Mr. T. F. Bunting, for a dust destructor. The Fair Meadow was the site chosen for the station, and its close proximity to two large breweries gave rise to grave opposition to the dust destructor, the scheme for which was abandoned at the time of the public inquiry. The station adjoins the existing station, the construction of which it is in keeping in style. It was designed by and has been executed under the supervision of the borough surveyor at a cost of £7,551, inclusive of the chimney-shaft, which absorbed £1,873. To safeguard against flooding by the Medway the floors have been raised 6 in. above the abnormally high water level of February, 1900, whilst the buildings below this mark have been made proof against water. The station comprises three blocks, and provision has been made for its extension towards the river. The centre block

consists of the engine-room and the pit for the condensing plant, on the right are the accumulator-room, stores, workshop, testing-room, engineers' private and general offices; and on the left is the boiler-house. The main entrance opens in the engine-room; a second entrance, facing the baths, leads to the offices. Large skylights run the whole length of the roofs of the three blocks, and the entire roof is white brick. The exterior is of Rainham red bricks, with York stone dressings, and Kentish ragstone base below the plinths. At the apex of the centre gable are the borough arms carved in brick. There is direct communication from the engine-room with the accumulator-room on the one hand, and the boiler-house on the other; and the engine-room is spanned by a powerful travelling crane. The floor of the engine-room is laid with Venetian marble mosaic, with coloured borders. The chimney, which adjoins the boiler-house; it is 152ft. high, with a concrete base 30ft. square, and a brick foundation 22ft. 5in. square, and the foot. The shaft is square 22ft. from the surface, and thence from a stone plinth is octagonal. The contractors for the buildings were Messrs. G. E. Wallis and Sons, of Maidstone. Four Davey, Beaman and Co.'s multitubular boilers, with an evaporating capacity of 6,000 lbs. per hour each at a working pressure of 150lb., and four square inch, constitute the steam-generating plant. There are five steam dynamos, four 160-kilowatt capable of developing 210 indicated horse-power at normal load, and 280 at overload, at 375 revolutions per minute, and one 75-kilowatt capable of developing 120 indicated horse-power at normal load, and 168 at overload, at 425 revolutions per minute. The air and circulating pumps of the condensing plant are driven by a compound engine, water being obtained from the river. The distribution of electric energy through the three continuous current system. The mains have been laid, a total length of over five miles, in the principal thoroughfares of the borough. The total amount of the contracts, exclusive of the buildings, was £28,733.

NEWCASTLE-ON-TYNE.—The Bishop of Thetford (Dr. Lloyd) laid recently the corner-stone of the parish hall and mission house which is being built by the Rev. the Vicar, the Rev. the Rector, and the Rev. the Curate, at All Saints' Church, Pilgrim-street, Newcastle. A large portion of the building contains classrooms and classrooms on three floors, with cloakrooms and lavatory, &c., and on the attic-floor a complete suite of caretaker's rooms. At the back of this building there is a hall on the first floor, 160ft. by 27ft., which parish hall below, 48ft. by 27ft., which will also be used as a gymnasium. The hall will have a separate entrance porch. Running parallel is a church house, having two sitting-rooms, kitchen, scullery, three bedrooms, attic bedroom, and bathroom, &c. A heating cellar is provided under a portion of the main building. The whole of the walls are to be built of brick, the two principal fronts being faced with Messrs. Lowe's bricks from Penshaw. The stringcourses, sills, and cornices are to be of moulded bricks. The contract for the work was let for £3,261, Mr. W. C. Tyrrie, of Gateshead, being the builder. Messrs. Hick and Charwood, of Newcastle, are the architects.

SOUTH KENSINGTON.—The Dean of Westminster laid, on the 12th inst., the corner-stone of the Church of the Holy Trinity, now in the course of erection in Prince Consort-road, a short thoroughfare behind the Imperial Institute connecting Queen's-gate and Exhibition-road. In the presence of an Order in Council, the present Church of the Holy Trinity, Knightsbridge, will be taken down, the site sold, and the proceeds given to the purchase of the new site and towards the cost of the erection of the new church. The site on which Holy Trinity now stands has been valued by the Ecclesiastical Commissioners at £14,000, £15,000, which sum they are empowered to advance upon the new site and the building, and the site having been acquired for £6,000, a sum of between £8,000 and £9,000 is left to go towards the £25,140 required for the new church, leaving £17,000 to be raised. The building now being erected has been designed by Mr. G. F. Bodley, A.R.A., and will accommodate about 800 people. The plans show a wide nave and chancel aisles, wide and lofty piers and arches, and traceried windows. It will be English in type, and will partake of the character of a town church in the style and manner of the 14th century. Stone arches of a bold character will be thrown across the aisles, in keeping with the

stone of which the church is to be built, and provision will be made for a morning chapel, spacious vestries, and a parish room. The building is to be completed by September, 1903.

CHIPS.

The supervising architect of the United States Treasury bill, in his annual report, recommend to Congress a change in the Tarney Act, by which the supervision of public buildings, erected under that Act, from the designs of private architects, shall be confined to the supervising architect's office.

Plans are announced by the Pennsylvania Railway Company for tunnelling the rivers which flow through Borough an island. The project is far larger even an American scale, the estimated cost approaching ten millions sterling.

On Saturday, the new Primitive Methodist Church at Seghill was opened. The church, which is built of red bricks with stone facings, will seat about 350 people, and has been erected by Mr. John Muggill, of Seston Sluice, at a cost of about £750.

Mr. G. F. Deacon, of Liverpool, the arbitrator in the waterworks dispute between Messrs. Holme and Kirk, contractors, of Liverpool, and the Mersey Urban District Council, has given his award. The claim was for over £20,000, of which £25,000 was in respect of extra costs occasioned the contractors by reason of the alleged delay on the part of the claimant's workmen. Mr. Deacon has awarded the contractors £2,036, each party to pay their own costs.

Cleekington Urban District Council have decided to make application for powers to borrow £2,025 for market-site extensions.

Earl Howe visited Portsmouth on Friday to unveil a tablet that has been erected at Curzon House in memory of his great-grandfather, the distinguished Admiral who was the hero of the glorious First of June, and who, when at Portsmouth, lived at Curzon House.

Mr. William Mounsey, a well-known Kirkcubright artist, died on Friday at Woodlea, his residence near Kirkcubright, after a few days' illness. Mr. Mounsey was in his eightieth year, and was a native of Glasgow. He had a long struggle for some time, and his friends will bear with regret his premature death just as he had reached a stage when fortune had begun to smile upon him. His work, which represented aspects of the rich scenery of Galloway and which he lived. At the last Glasgow Institute Exhibition he reached his best in two charming landscapes—"The White Farm" and "The Castle." Since 1888 he had been a member of Kirkcubright Town Council.

Mr. Yerkes has awarded the contract for the electrification of the Metropolitan District Railway to the Westinghouse Electric and Manufacturing Company of Pittsburgh. The work, or the greater part of it, will be undertaken at the company's works at Manchester, and it is hoped that a start may be made within the next few weeks. A portion of the installation will be put in hand at once at the company's works at East Pittsburgh, Pennsylvania, in order to hasten the construction of the plant.

The extension of the Admiralty Pier at Dover, forming the western arm of the national harbour, has for some time past caused considerable difficulty with the pierhead light. The masonry lighthouse was superseded by a higher masonry structure, but with the increase of machinery on the pier the extension light became obstructed. Recently a novel travelling lighthouse, designed to meet the case, was used for the first time. It is carried on a travelling trolley similar to those which are used on the pier. As the pier extends, rails will be laid, and the lighthouse move out.

The corporation of Southampton are advertising for a borough engineer and surveyor, at a salary of £200 per annum, in succession to Mr. W. B. G. Bennett, resigned.

The Saxmound Urban District Council have resolved to engage Messrs. Beesley, Son, and Nichols, of Westminster, to prepare schemes of sewerage and water supply for the district.

Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham, has been instructed to prepare a report upon the supply of water in the parish of Gosforth, in the Whitehaven Rural District.

The Coleford urban district council have adopted schemes of water supply and sewerage for that town prepared by Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham. The water will be obtained from a deep boring in the pier of sandstone; the sewage will gravitate to the outfall, and be disposed of bacterially. The estimated cost is £10,000.

Engineering Notes.

NEWCASTLE-ON-TYNE.—Tenders are invited for the erection of a new high-level bridge over the Tyne. The bridge is to be one for railway purposes, to be erected between the Redhugh highway bridge and the present high-level bridge. The North-Eastern Railway Company has obtained powers to construct the bridge two sections ago, and some preliminary work has already been effected. The new bridge is to be built of Siemens steel on stone piers. It is part of a new line from the Central Station to a junction with the Team Valley line on the south side of the Tyne. The bridge itself will be some 750 ft. long, and 48 ft. wide from centre to centre of the parapets. The central spans will be of 308 ft., each supported by stone pillars, and the bridge is intended to carry four lines of rail. Designed by Mr. Charles A. Harrison, the North-Eastern Railway engineer, it is expected that the cost of the bridge and its approaches on both sides of the Tyne may be said to be approximately £500,000. The new bridge will not only facilitate the railway working of traffic, but it will add greatly to the facilities for improving railway access to and from the south side district. It will allow the north and south traffic to pass through the Central Station without the delay that arises from the need to reverse the train at that point under the existing arrangements. It will also relieve the old high-level bridge of some of the traffic north and south of the Tyne.—The new electric tramway service was opened on Monday by the Mayor (Mr. Newbould), and the system has been put to the present £400,000, and is expected eventually to cost £800,000. Curs were run on four routes, those from the centre of the city to Jesmond, to Osborne-road, to Gosforth, to Brighton-grove, and Heston by way of the City-road and Ryby street, and the lines in the other districts are being rapidly completed. The whole scheme comprises 42 miles of single track. Mr. H. Rossignol is the chief electrical engineer, Mr. H. Richardson the engineer at the power station, and Mr. Nuttall was the contractor for the permanent way. The power station, which was built by Messrs. Stephenson, was the steam-generating plant, consisting of eight Lancashire boilers, built and erected by Messrs. Thomas Beesley and Sons, of Hyde, Manchester. Three of these boilers are fitted with steam superheaters. The steam-pipe arrangements are of riveted steel, also made and erected by Messrs. Beesley. The machinery in the engine-room consists of one 2,000 H.P. engine built by the Wallsend Slipway and Engineering Co., coupled to a 1,300 kilowatts generator, built and erected by the British Westinghouse Co., also two engines each of 1,000 H.P. built and erected by Messrs. Victor Coates and Sons, of Belfast.

Colonel Hepper, D.C.O., C.E., and Mr. Burd, inspectors of the Local Government Board, held an inquiry at Goole on Tuesday into an application of the Goole Harbour Board for a grant of close upon £19,000 for gas and water works purposes.

Dr. Charles Porter, M.D., of Shrewsbury, Medical Officer of Health under the Salop County Council, has been selected for the appointment of Medical Officer of Health to the municipality of Johannesburg, at £2,000 per annum.

The partnership hitherto subsisting between T. Gregory and G. C. Hudson, of Shrewsbury, Station Works, Clapham Junction, under the style of Thomas Gregory and Co., has been dissolved.

The Bishop of Oxford reopened on the 12th inst. the parish church of Penn Street, Bucks, which has been restored at a cost of £1,000 by Earl Howe in memory of his father, the late Earl.

The death of Mr. Thomas Wilson, aged 69, a well-known builder and contractor, of Strathdown, Balne-lane, Wakefield, who committed suicide by hanging, was inquired into on Saturday. William Wilson, a son, said his father left no note to show why he had committed suicide. He had never shown any signs of insanity, although seven years ago he had the influenza, and occasionally complained of pains in his head. He had had no trouble, but a little extra work was given him one night. The jury said that he was "temporarily insane."

The Lord Mayor of Bristol has sent an invitation to the Prince of Wales to visit that city next March to perform the ceremony of cutting the first sod of the new Central Railway, which is to be constructed by the city, as the owners of the docks, at a cost of close upon two millions sterling.

PROFESSIONAL AND TRADE SOCIETIES.

BRISTOL SOCIETY OF ARCHITECTS.—The monthly meeting of this society has been held at the Fine Arts Academy, Clifton. In the absence of the president, the chair was taken by Mr. J. H. La Trobe, F.R.I.B.A., Mr. Harold Smith, A.R.I.B.A., lecturer on architecture at the Merchant Venturers' Technical College, delivered an address on "Paris, Past and Present." This fascinating subject was fully illustrated by lantern slides and by a large collection of prints and photographs showing various phases of French art. At the conclusion of the address a vote of thanks was proposed to the lecturer by Mr. Harford, seconded by Mr. Mowbray Green of Bath, supported by Messrs. Dare Bryan and Thompson, and carried with acclamation.

LIVERPOOL ARCHITECTURAL SOCIETY. Mr. C. J. Anderson presided on Monday evening at the second members' meeting. The address, held in the lecture-room of the Law Society, Castle-street, Liverpool. A paper was read by Mr. C. Brian of Messrs. Waring and Gillows on "Wood Staining and Veneering," in the course of which he referred to the methods employed in this work, and described the knife and the latest machine processes for veneering. Subsequently Mr. James Cook exhibited and described a series of lantern slides of English and French cathedrals. Cordial votes of thanks were passed to Mr. Brian and Mr. Cook.

NORTHERN ARCHITECTURAL ASSOCIATION.—A meeting of this association was held on the 12th inst., at the offices of the Association, 36, Northumberland-street, Newcastle-on-Tyne. Mr. J. Miller Carr, the representative of Messrs. Doulton and Co. for Newcastle district, delivered a lecture on "Terra-cotta Construction, Glazing and Ceramic Mural Decoration." The lecturer at the outset referred to the ancient history regarding terra-cotta, and then to the modern use of the material. In doing so he remarked that it was a fact that building materials have an increasing value from a decorative point of view, exactly in proportion to the richness and variety of their surface. Speaking of the use of terra-cotta and terra-cotta, they must say that ten years ago they were in the full tide of uniformity in architects' specifications. A few years later a close approximate uniformity was attained with the same material, and after some eight years the feeling for true art advanced in the country by leaps and bounds. The saddest thought he had to-day about colour in terra-cotta buildings was that they did not really know what value and beauty they might have if only they would let Nature have her own way. Terra-cotta was made, as they knew, by hand, and out of a mould in a general way. In that case they had an artist, as well as an architect. One of the principles he laid down was that the true methods of use of any material should be such as were suited to its nature and properties. A successful use of faience involved a true understanding of terra-cotta as its foundation. They must consider the materials suitable for exteriors of buildings in this country. He then at great length explained the various experiments respecting this matter, after which he proceeded to say that with reference to interior buildings—ceramic materials for the same—the subject was so large and varied that it would require more than all the time at his disposal that night to even adequately touch on its more salient points and possibilities. In his opinion it was a mistake, for many practical reasons, to attempt to carry out glazed treatments for the internal parts of buildings at the present time. The general structure of the exterior was proceeding. The question arose: Was it not possible to depart with advantage from some of the traditional forms of treatment for interiors? He next asked their attention to the various examples of ceramic mural decoration on the screen, and pointed out the mistakes of each, as an example. Afterwards the ex-president of the association Mr. W. Glover was presented with an illuminated address and a silver inkstand on his leaving the district for the South after 17 years' membership.

SHIREFIELD SOCIETY OF ARCHITECTS AND SURVEYORS. The monthly meeting of this society was held at the society's room, Leopold-street, on the 12th inst., Mr. T. Winder occupying the chair. The following gentlemen were elected members of the society—Associate, Mr. S. H. Ellis, students, Messrs. E. Parks, J. M. Jenkins and D. B. Jenkinson, P. Roberts, and J. R.

Truelove. Much regret was expressed at the death of Mr. C. J. Innoce, a past-president of the society, and a vote of condolence and sympathy with his widow and family was passed. Mr. A. Jeffery, the well-known artist in stained glass, delivered a lecture on "Stained Glass." Mr. Jeffery commenced by giving a slight history of stained glass, passing through the different styles and periods which were fully illustrated. He showed the first stained glass executed in England was in the time of King John. Previous to this all glass came from Italy, which even at this date boasted of eminent artists. The old masters taught us many lessons, and much could be learned from them. They made the most of what they had, and put it to its best advantage. We should, he urged, try and embrace all the good qualities of the old men, ignore their shortcomings, and try and improve on what had been done before us. What a man sees is impressed on his mind, and unconsciously, perhaps, months or years after unknowingly he uses part of these impressions. After the 16th century stained glass died out, and did not again revive until the 18th century. Mr. Jeffery went on to explain that a window should be part of a building, a mode of letting light into the building, and should not be treated as a picture or wall decoration. If a man attempted a picture he spoiled his material as glass, and made a very bad picture. The lecturer described the different methods of the manufacture of stained glass, and the various processes he painted, then fired, and afterwards leaded. He said that English glass was superior to foreign, both in material and workmanship. The most important point in a window, in his opinion, was transparency, and only the most permanent colours should be used, at whatever cost. Speaking of domestic glass, he did not think the country builders were inferior, and that it had come to stop, but like all other transitions in art at the outset, it seemed to have been let loose, and we appeared to be seeking after something we could not grasp. But the style would ultimately settle down and find its own level. After showing samples of modern work, both German and English, in bevel work, also brass and iron, and a passing reference to stained glass, Mr. Jeffery, in conclusion, said he was eagerly looking forward to the time when there would be so much commercialism in connection with artistic crafts, and he hoped architects in the near future would come more into contact with the craftsman, and by their joint ideas succeed in raising higher the standard of work. By so doing he thought there would be a bright prospect for stained glass in the future. The lecture was illustrated by drawings and examples of stained glass. On the motion of Mr. C. Hatfield, seconded by Mr. J. Smith, and supported by Messrs. W. J. Hale and H. L. Paterson, a vote of thanks was accorded to the lecturer.

The models submitted in competition for the Borough of Ipswich Queen Victoria Memorial to the selection committee have been on view in the library of the town-hall at Ipswich throughout the present week.

A special meeting of the Cardiff Town Council adopted the recommendation of the tramways committee that a final offer of £50,000—inclusive—be made to the tramways company for the whole of their interest in the tram-lines up to the doors of the new station, as an offer has been accepted.

At the London Sheriff's court on Friday, before Mr. Under-Sheriff Burchell and a special jury, Mr. C. H. Loebbeck, model engineer and scientific toy manufacturer, of 38, High-street, South Kensington, was awarded £20,500 and costs against the supposed County Council for the compulsory acquisition of his premises by the Council in connection with their scheme for widening High-street.

The isolation hospital, Clapham, Beds, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke-flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The National Queen Victoria Memorial Fund has now reached the total of £185,000 towards the quarter of a million sterling originally suggested as the sum to be aimed at.

On Wednesday Colonel W. R. Slack, R.E., Local Government Board inspector, held an inquiry at the town-hall, Waterloo, Liverpool, respecting the application to the Local Government Board, by the district council of Waterloo-with-Seaforth, for sanction to borrow £2,000 for purposes of public lighting, and £1,175 for purposes of street improvements in the district.

STATUES, MEMORIALS, &c.

CARLISLE.—Mr. T. Brock, R.A., visited Carlisle on Friday last, in conjunction with the Mayor and members of the Town Council, formally fixed upon the site for his statue of Queen Victoria, which is to be erected by the Corporation. A dummy statue, with pedestal, had been made by the Corporation from designs by Mr. Brock, and had been placed upon the proposed site. Mr. Brock expressed the opinion that the site which had been selected in the public park, and which is overlooked by the Castle keep, was the best that could be found in the city. The statue, which will be of brass and 13ft. high, will stand upon a pedestal of fine-axed Aberdeen granite, 15ft. high. Queen Victoria will be represented in her Imperial robes over bodice and skirt, wearing an Imperial crown, and with an orb surmounted by a figure of Victory in her left hand, and a sceptre in her right. The four panels of the pedestal will be filled in with figures representing Empire, Education, Science and Art, and Commerce. It is intended that the statue shall be ready for unveiling in June, before the Royal Show.

CHIPS.

A memorial window has been placed in All Souls' Church, Halesden, in memory of the Rev. Hubert E. Carlyn, vicar of the church 1893-1900. It is like the window erected to the Carlyn family at St. Just's, in Roseland, Cornwall.

Though busily engaged in connection with the national memorial, the Queen Victoria, Mr. Brock, R.A., has made good progress with the statue of the late Lord Russell of Kilowen, which represents the deceased judge in a seated position, wearing his full robes as Lord Chief Justice.

Mr. Justice Wills, in the King's Bench Division, tried, on Wednesday, an action brought by Messrs. Knight, Frank, and Rutley, solicitors and estate agents, carrying on business in Court-street, E.C.4, against Mr. Harvey du Cros to recover £2,000 as commission on the sale of the Cornbury Park Estate, Charlbury, Oxfordshire, which he sold in the early part of last year for £200,000. The defendant admitted that the commission was due to someone, and the judge, after hearing the evidence, gave judgment for the plaintiffs for the amount claimed, with costs.

The Local Government Board have granted the corporation of Heywood permission to borrow £1,263 for the purchase of land for the Heap Bridge sewage scheme. Application had also been made for power to purchase the property of the late Mr. de la Haye, of Heywood, who was a partner in the destruction of the Heap Bridge sewage works, the Captain Fold drainage system, &c., and the board intimate that they will communicate further with the corporation on these other matters.

A cottage hospital is about to be built at Southwold from plans by Mr. E. N. Cubitt, architect, of Brentwood.

Over 1,100 houses are being erected at Poulter's End, Middlesex, by the Enfield and District Freehold Land Co., Ltd. The architects are Messrs. Michael Faraday and Rodgers, of 77, Chancery-lane, W.C., and Poulter's End.

The urban district council of Horwich have engaged Messrs. Hinmell and Murphy, M.I.C.E., of Manchester and Bolton, to inspect their sewage works, and report and advise them upon the works necessary to make them efficient to satisfy the Joint Ribbles Committee.

The most important improvement carried out in Exeter since the widening of Bedford-street twenty years ago is about to be entered upon by the city council, who are anxious to employ an expert to advise upon the best means of reconstructing the bridge across the Exe and expanding the contiguous thoroughfares on the St. Thomas side. The estimated cost of the scheme will be £30,000. The bridge is highly arched, and there is a very steep gradient on the western side. The undertaking is a sequence to the compact entered into between Exeter and St. Thomas when the city and suburb were incorporated in one.

The winter session of the Architectural Section of the Royal Philosophical Society of Glasgow was opened on Monday evening, when an address was given by the president, Mr. James Chalmers, I.A., architect, of Glasgow, on "The Sphere of the Architect in Relation to Religious Art."

Captain Sir W. Abney, secretary of the Secondary School Branch of the Board of Education, visited Watford on Friday for the purpose of opening the new School of Art on the Watford School, which have been erected by the governors at a cost of £2,000.

A meeting of the Edinburgh Architectural Association was held in the new rooms, 117, George-street, Edinburgh on Wednesday. The president, Mr. Henry F. Kerr, occupied the chair, and read a paper on "Ventilating and Heating" was read by Balfie Mackenzie.

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ILLUSTRATIONS.

VIRGIN AND CHILD, by ALBERT TURNER. "VOTAGES AT WESTGATE. — KING'S GARDENS, HAMSTEAD. — DINING-ROOM AND STAIRCASE, "ADDRESS GRANGE," HANTS. — KITCHEN AND CUPBOARD, "ADDRESS GRANGE," HANTS. — BATHS AND WASHHOUSES FOR THE SCHOOLS OF CAMBERWELL. — FIRST PREMISED DESIGN.

Our Illustrations.

VIRGIN AND CHILD, by ALBERT TURNER.

THE Madonna, in the history of Christian art, has always held a leading place from the earliest days of our era to the present time, and some of the most priceless examples of the Old Masters are employed in depicting the sacred subject. To-day we have chosen one of these from the original now in the collection of King Edward in Windsor Castle, and painted by the famous Albert Dürer. The Virgin Mary, holding the infant Saviour, is seated on an elaborated Gothic throne with sculptured figures in niches on the piers supporting a canopy. Beyond, landscape appears, with a view of some buildings to the left. Two Episcopal saints kneel on either hand of the Madonna, who is crowned as Queen of Heaven. The lily in a pot, emblem of Our Lady, stands in front of the group. The broad handling of the plain drapery of the central figure and bald head of the Virgin contrast greatly and enhance the richness of the more elaborated features in the picture.

CANTERBURY PARADE, WESTGATE-ON-SEA.

THESE cottages have been erected for the Westgate-on-Sea Land and Building Co. They are constructed of red brick, and have red hanging tile facings and projecting wooden bays on the first floor. The roofs are covered with local tiles, the chimneys being rough-cast and crowned with stone caps. The architects have endeavoured to obtain breadth and architectural effect by a simple treatment of the general mass. The buildings cost some £3,500, and were carried out by Messrs. Flint Bros., of Clapham, and Messrs. Banister Fletcher and Sons were the architects.

KING'S GARDENS, HAMSTEAD.

THESE buildings are now in course of erection, and occupy the site of the "Chimes," West End-lane, N.W., recently demolished, and the residence of the late Mr. Herbert, R.A., having a frontage to West End-lane of 260ft., and a depth of 100ft. The buildings will consist of 12 complete flats with from six to eight rooms, approached by an ornamental garden court and carriage drive. There will be spacious entrance-halls with marble mosaic floors to each flat. An electric passenger lift will be fitted to each block, and the flats will have the latest sanitary and electrically improved fittings. The cottages will be in red bricks with Bath stone dressings and green slated roof. Messrs. Palmgrave and Co., Victoria-street, S.W., are the architects, and also for the adjoining buildings, Carlton Mansions, and the large building abutting on to the rear of the site, namely, Friary-court. Messrs. C. Gray and Co., of Shepherd's Bush, are the contractors, and Mr. J. Farrell is clerk of the works.

"ADDRESS GRANGE," HANTS.

THE illustrations refer to the house which we have already illustrated in our issue of Oct. 18. As then stated, the whole of the interior has been paneled in oak. The dining-room is paneled nearly to the ceiling height. The fireplace has a recessed upper portion, and small moulded columns supporting the entablature: it is lined with red lustre tiles and Verona marble architecture. The doors in this room show a somewhat unusual treatment, accommodating themselves to the walling which lines the walls. The door furniture consists of drop handles and plates, supplied by Messrs. Elsley. The ceiling is of anglypta, and is of formal character. The illustrations of the hall show main stairs of solid oak, which, with the carving, has been made to the architect's designs by Messrs. Elliot, of Newbury. The right-hand portion indicates a portion of hall and dining-room door, and the passage beyond leading to the service portion of the house. The panelling and fireplaces throughout have been executed by Mr. J. P. White, of Bedford, to the detail drawings of the architects, Messrs. Banister Fletcher and Sons.

NOS. XXVIII, CXXIX, CXXVNE WALK, CHELSEA.

THE home of J. M. W. Turner, R.A. He lived here under an assumed name for some years, until his death in 1846. The house, built in the early part of the 18th century, and contains many interesting features, some of which are shown in the illustrations; but at the date of the commencement of the restorations in 1897 they had been allowed to get into a dilapidated condition. Numerous outbuildings containing stables and sheds had also been built in the rear, and these were all cleared away and a large studio erected. The interiors of the houses, which contained paneled rooms and some interesting fireplaces, were cleaned and repaired; the lower rooms of No. 118 formed into a hall, being paneled with white-painted woodwork, red-tiled roof, and decorated as shown in the photograph. The old wrought-iron brackets supporting canopy over front door were restored to their original positions from a back scullery, where they were used to hold up a shelf. The small iron balcony on the roof of No. 119 was fixed by Turner himself, together with a platform, from which he took his numerous views, and a tablet recording Turner's residence, and designed by Mr. Walter Crane, has lately been set on the front of the houses. C. R. ASHLEE.

PROPOSED BATHS AND WASHHOUSES FOR THE BOROUGH OF CAMBERWELL: FIRST PREMISED DESIGN.

WE give a perspective view of the exterior of the selected design in this competition. The architect is Mr. E. Harding Payne, of 28, John-street, Bedford-row. We have described the design, which was awarded first premium by the assessor, Mr. A. Saxon Snell, in our notice of the competition elsewhere.

At the last meeting of the city corporation the improvements and finance committee submitted for adoption the award of Mr. E. Gunning in respect of the freehold interest of the trustees and managers of the Stock Exchange in the ground required to widen the public way in front of the premises 82, Old Ford-street, amounting to £5,500. The Court approved.

A special meeting of the Oldham Town Council was held on Friday evening, when a resolution was carried by 26 votes to one authorising the council to seek Parliamentary powers for the construction of a high-level vehicular and pedestrian bridge from Rhodes Bank, Union-street, across the railway lines, to the Glodwick side of the town, debouching upon Preston-street. Subsequently a statutory public meeting was held, at which a similar resolution was passed by a large majority. The bridge, as described in the plans accompanying the Bill, is to be 302 yards long, and 16 yards wide, and the estimated cost of the bridge and the incidental street improvements necessary is £78,283.

The proposal to alter the tone of "Peter," the huge bell which hangs in the clock tower at Exeter Cathedral, has been abandoned, on account of the difficulty of shifting the bell, which weighs six tons, from its place. Big "Peter" will be retained, notwithstanding, and also the other bells in the tower, at a total cost of £1,250.

Messrs. Gossage and Sons, soap manufacturers, Wigan, together with a number of other manufacturers, have acquired a site of 141 acres at Rutheath, Northwich, and are about to erect a large works for the manufacture of chemicals and by-products. The site has a frontage to the North of England Canal and the London and North-Western Railway.

COMPETITIONS.

NEW PARLIAMENT HOUSES, PERTH, W.A. — In our issue of Sept. 27, p. 417, it was stated that the authors of the first premiated design for the new Parliament Buildings at Perth, Western Australia, were Messrs. H. Tassell, W. B. Hardwick, W. Wilkinson, and A. Herber. The first name should have been given as that of Mr. Hillson Huxley, Assistant-architect P. W. Dept., Perth, W.A.

WIMBLEDON. — In the limited competition held recently for the extension of the Wimbledon Public Library, the design submitted by Mr. R. J. Thomson, A.R.I.B.A., of 49, Hill-road, Wimbledon, has been accepted for the work which is to cost £2,500.

CHIPS.

The Emperor William has given permission for the erection of a monument to the late Herr Treitschke, the historian, in front of Berlin University.

Bideford Town Council held a special meeting on Friday to consider the question of the site for a free library to be built with the £1,600 provided by Mr. Andrew Carnegie, and resolved to adopt a site at Bridge-end.

Hull Corporation Art Committee have agreed to increase the sum allowed for the new art school from £10,000 to £12,000.

The Rev. Stephen Barrass unveiled on Friday a memorial which has been erected in the Church of St. Lawrence Jewry to Private W. A. Walker, who died of enteric while serving with the City Imperial Volunteers in South Africa. The memorial, which has been placed in the tower vestry of the church, takes the form of a bronze mural tablet, and is surmounted by the City Arms, with the motto "Domine Dirige Nos." Underneath are the words "City Imperial Volunteers," and flanked by the letters "V.R." Below this is the motto "Dulce et decorum est pro Patria mori." The centre of the tablet is occupied by the inscription.

Princess Christian opened at Northampton on the 12th inst. a nursing institute, erected as a permanent memorial of the Diamond Jubilee of the late Queen Victoria.

At the last meeting of the Swindon Corporation the waterworks committee reported that they had spent £1,074 18s. 4d. up to the present on the experimental works at Osbourne, for the purpose of adding to the water supply in the event of a drought. The output from the borings totalled 200,000gal. for 24 hours' continuous pumping. This was considered satisfactory, and the committee were voted a further £500 to carry on additional works.

The Metropolitan Asylums Board have instructed Messrs. T. W. Aldwinckle and Son to prepare a scheme for additional accommodation for small-pox patients at Gore Farm Hospital at an estimated cost of £17,000.

Grainge-over-Sands Urban District Council have formulated a scheme of sewerage and foreshore improvement, and for this purpose have purchased from the Duchy of Lancaster the whole of the foreshore along their district. It is proposed to run the sewer along the railway embankment next the sea front the entire length of their district, and the beach with covered paths to be formed into a promenade, fenced both from the sea and the railway. The cost will be £12,675, and a Local Government Board inquiry was held on Friday about it.

The official programme of the International Industrial and Commercial Exhibition at Exeter, from the 1st to September 15 next, has just been issued. The exhibition will be held on the Champ de Mars, occupying a space of about 50 acres. Exhibitors will be divided into two categories: (1) manufacturers and producers; (2) those who exhibit articles made by others. The prizes offered will consist of diplomas of "Grand Prix," "Diplomes d'Honneur," gold, silver-gilt, silver, and bronze medals, also diplomas of honourable mention.

Work has just been made in the work of clearing the site for the extension of the Bristol Museum, and the provision in connection therewith of a municipal art gallery. Sir William Henry Walls undertook to provide the city with an art gallery on the site of the former Salisbury Club, adjoining the museum, if the corporation would spend about £10,000 on the extension of the museum, the offer this made by Sir William being accepted, to £20,000. The offer was thankfully accepted, the new buildings will have a frontage of 120ft., and will rise to the same height as the present museum, with which they will be connected. The architect is Mr. Francis Hastings Wright, of junction Victoria-street, and the work has been entrusted to Messrs. Cowlin and Sons, of Bristol.

DESIGN FOR BOARD SCHOOL VICKERSTOWN.

BY W. MOSS SETTLE, R.E.



BOARD SCHOOL, VICKERSTOWN.

THIS design was submitted in a recent competition by Mr. W. Moss Settle, A.R.I.B.A., of Barrow-in-Furness. The walls, 4ft. high, are shown with a plinth of red facing bricks, above that rough-casted, with Westmoreland green slate for roofs. The plan shows the arrangements.

EXPERIMENTS OF METAL BRIDGES.

EXPERIMENTS on French metal bridges made by the Orleans Railway Company have shown that the structures investigated are stronger than they appear to be if calculated by the common methods. M. Lanna, chief inspector of permanent way, has reported the results of these experiments to the International Congress for Testing Materials, and the results are briefly as follows:—With regard to short spans, if the rails are of the double-headed pattern, the concentrated loads are distributed by the rail chairs. A notable reduction of the greatest bending moment was obtained by placing the chairs about one foot to each side of the centre of the span for all spans up to 18ft. For spans greater it is advantageous to put a chair at the centre of span. M. Rabut estimates that continuous rails is equal to a reduction of the effect of the live load from more than a quarter at average speeds, to more than a third at high speeds, and the experiments prove these conclusions. The joints of the rails on short bridges are therefore undesirable. It has been also shown that no rail joint on the span, a longitudinal wooden tie of one piece extending beyond the length of the beam, and long bearing base on the abutments, really have the effect of fixing short-span girders at the abutments, and making a considerable reduction of the calculated stresses. Bridges on the Tours-Mans line have been found stressed to half of the calculated amounts. Another relief to the stresses is the rigid connection of the stringers to the main trusses. Thus, on the line from Lexos to Toulon on a bridge 16·5ft. span of the box-section type, a stress of 5,000lb. per square inch has been found in the lower flange of one of the stringers, while the lower flange of the nearest box-girder showed a stress of 6,140lb. per square inch for the same condition of loading. It was found that points of the neutral axis showed a very considerable difference in stresses. This may be due to faulty construction, as when the axis of the rail does not lie on the central plane of the web of girder. A slight eccentricity of $\frac{1}{16}$ in. to $\frac{1}{8}$ in. is sufficient to produce this result, and M. Rabut has found that unequal bearings under the two flange angles of a girder produce a similar result. So, in the

box girders, the middle piece between them deflects, and tends to draw the top flanges together, the result being increased stress on the outside edge and a decreased stress on the inside edge of the top flange.

Referring to Main Pony Trusses in longer spans, when the track is placed on the lower part of trusses, there being no overhead bracing, "it was always found that at the centre of the truss the maximum bending moment produced different intensities of stress in both sides of the upper flange; and the apparatus of M. Rabut, attached to the outer edge of the upper flange, always registered a greater stress than the apparatus attached to the inside edge." This is explained thus:—Under the action of the load the floor-beams deflect and cause a rotation of the trusses around the lower and inward, which tends to draw together the top flanges of the two trusses. The upper flanges thus have a tendency to form a curve, which begins at the end where the flanges are immovable, and increases towards the centre. The difference of intensity of stress in both edges is very considerable in old structures. This proves the value of very rigid end-posts or angles in opposing such deformation in pony trusses. With the floor at the bottom flange of the truss, the lower flange is stressed less than the upper flange; the longitudinal stringers, it is considered, taking part of the stresses often assigned to the lower flanges of main girder. From this it appears that in pony trusses of a span not exceeding 125ft., the greatest stress in the main trusses will be found in the outside edge of the upper flange near the centre of the span. Referring to floor-beams and stringers, the experiments proved that the floor-beams were never held firmly at their ends. Each time the apparatus was applied to the ends of lower flange of floor-beam, it registered an extension. Under the action of the loads, the floor-beams are subjected to a torsion due to the deflection of the most loaded stringers, leading to the conclusion that floor-beams should always be figured as simple supported beams, and their stress be taken as the distance from centres of trusses. As regards stringers, the elongation of the truss members is transmitted by the floor-beams to the stringers, and the loose rivets so often met with in the connection of stringers to floor-beams are due to this cause. If the rail is not set exactly central with the centre plane of stringer, considerable difference in the stress on the two edges of the flange will be found. On the Creuze Viaduct there was found, for a quantity of $\frac{1}{16}$ in., a tension of 13,500lb. per square inch on the inside edge of lower flange, and one of 4,270lb. at the outer edge. The eccentric bearing of the rail had produced a torsion from outside in, and showed the value of precision. For curved bridges, the

stringer should be rigidly braced. Experiments also demonstrated that, as to riveted web members, the stresses due to deformation of these members are very complex; but we cannot notice them here. It has also been shown that horizontal wind-bracing takes a part of the main truss chord stresses, and that deformation occurs under accidental overloads, and therefore the desirability of considering these actions, especially the riveted connections in designing a wind-bracing system.

CHIPS.

At a special meeting of the Kettering Urban District Council held on Friday, it was decided to go in for works of electricity, public baths, and a refuse destructor. It was estimated that the cost of the site for baths would be £11,130, for baths £4,200, and for electricity works £48,450.

The North-Eastern Railway Company have decided upon making extensive improvements to their system in the vicinity of Milford Junction, Sherburn, South Milford, and Gascoigne Wood Junction, necessitating the erections of new station premises. A step towards the end is to be the closing altogether of the Gascoigne Wood Junction, South Milford Station and the island station at Milford Junction are to be cleared, and as substitution there is to be a new station erected in the vicinity of the bridge, which crosses the York line near Sherburn Station, and carries the main thoroughfares between Leeds, Selby, and Hull.

A meeting was held in the Lord Mayor's Parlour, Manchester Town Hall, on Friday afternoon, to make arrangements for the Congress of the Sanitary Institute to be held in September, 1902. A large committee was nominated representing the many interests in Manchester allied to the work of the Congress, and sub-committees were also nominated to carry out the arrangements for the meeting. The Earl of Eglinton, of Tatton, has accepted the office of president of the Congress.

At the last meeting of the City Corporation, a report was received from the Cattle Market committee recommending the erection of additional chill-rooms and works connected therewith at the Foreign Cattle Market, and the renovation of old chill-rooms 1 to 7 at an aggregate estimated cost of £40,500. The committee also asked for authority to confer with the coal and corn and finance committee in regard to meeting the expenditure. The report was adopted without discussion.

The general purposes committee of the Wolverhampton Town Council have issued a report with regard to the proposed alterations and additions to the town-hall buildings. Seven tenders were received, and the town council is recommended to accept that of Messrs. H. Willcock and Co., of Wolverhampton, amounting to £14,550, and request them to tender for the panneling of the council chamber and the mayor's reception-room, and the erection of a gallery in the council chamber.

PROPOSED BATHS AND WASHHOUSES FOR THE BOROUGH OF CAMBERWELL



E. HAZING, PAINE ARCHA
ARCHITECT - C. 220
25, JOHN STREET
BEDFORD-ROW, W.C.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bond copies of Vol. LXXX are now ready, and should be ordered early (price 12s. each, by post 12s. 10d., as only a limited number are done up). A few bond volumes of Vols. XXXIX., XL., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L., LII., LIII., LIV., LV., LVII., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., and LXIX. may still be obtained, but the number of all the other bond volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring large numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" (not including Town, Warehouse, and Shipments for every eight words after 4s. Situation Advertisements must be prepaid.

CHRISTMAS WEEK.

THE BUILDING NEWS will be published in Christmas Week on the morning of FRIDAY, DECEMBER 27, as usual; but as Wednesday and Thursday are holidays, it will be necessary to go to press on Tuesday.

All advertisements, therefore, for that week's issue must reach us by 3 p.m. on TUESDAY, DECEMBER 26.

RECEIVED—J. B.—W. J. E.—C. W. and Co.—A. H.—A. D. and Co.—E. J. A.—J. T. W.

EXAMINE 1. No. 2. About the end of January.

Correspondence.

OLD KENT-ROAD BATHS AND WASH-
HOUSES.

To the Editor of the BUILDING NEWS.

SIR,—It is most likely that some other competitors besides myself will feel dissatisfied with the result of this competition, and if it were a question of taste no good would come of registering an expression of such dissatisfaction; but after seeing the plans I can come to no other conclusion than the opinion that Mr. E. A. Scoll has overlooked some, at least, of the most essential conditions laid down in the Instructions to Architects when he awarded the first place to the chosen design. The condition that the boilers should be really removed without having to pull the building about is entirely overlooked in the plan, as the establishment laundry is placed between the boiler-house and the street. This laundry is badly lighted and ventilated, depending as it does on pavement lights. The Turkish-

baths, well arranged in themselves, are almost entirely dependent upon lantern lights in front of the premises in Old Kent-road, whereas they run back a considerable distance under the main buildings, and are very deficient both in light and air. The conditions stipulated that a club-room available also for committee meetings should be provided 20ft. square, or of that area, in the chosen plan this has not been done, though it was a condition that this large room should be available also for swimmers. Instead, a committee-room is provided on the first floor. Half the second-class bath is covered over by the first floor carried over it, in order to get room for fifty slipper-baths for the second-class men, and consequently this bath will be very dark and low, the dressing-boxes being quite dark in this sort of tunnel arrangement over close upon half its entire area, which alone should have excluded this scheme;—giving, too, as this defect does, an undue advantage on the first floor over other competitors who took it as an essential feature that both swimming-baths should be thoroughly well lighted and ventilated. Besides this, the women's second-class bath is almost totally devoid of light. The section shows side-lights; but these only extend a very short way along the women's second-class baths, for the good reason that the men's baths come over as above described. No plan of the whole fifty-two sent in is perhaps perfect; but few present more radical faults than those to which I have alluded, and these are questions of fact, and not matters of mere opinion. As to the elevations of the first premiated scheme little need be said, as evidently the choice was not made on that account, and, I am told, does not profess to be. The second design is also distinguished by two serious blemishes in planning;—viz., the public washhouse is not on the ground-floor level, so that all the baskets and bundles of clothes would have to be carried up an awkward staircase every day the washhouse is used, and the second-class bath is placed considerably below the level of the sewer, so that all the waste water would have to be pumped up to get rid of it—a constant source of expense. The boilers could not be got out easily either in this plan. Surely these are reasonable grounds for complaint, even if they are made by a rejected competitor, who took care to avoid similar faults, and who sacrificed fancy details, and gave ample light and air.—I am, &c., A BATH BUILDER.

Railway and tramway engineers and contractors will be interested in the fact that at Llandudno Police-court, on Monday, the foreman playmaker in the employment of Messrs. R. White and Sons, contractors for the Great Ormeshead Tramway, was summoned for carrying on his ordinary occupation of a foreman playmaker, the work not being done by a convict or charity. The playmaker's respondent stated that since the summons was issued the Sunday labour on the railway works had been discontinued, and he had no desire to press the case. The case was dismissed on payment of costs.

Mr. Charles Villiers Wilson, architect, of 31, Sughall-road, Chester, was found the other evening lying insensible at the foot of the City Wall steps in Northgate, Chester, and was taken to the infirmary in a conveyance. Before arriving at the institution, however, Mr. Wilson had expired, and Dr. Hamilton subsequently certified death to be due to heart disease. Mr. Wilson was about fifty years of age, and was highly respected in the locality.

Application having been made to the Local Government Board by the Grantham Town Council for sanction to borrow £2,000 for the purpose of establishing a municipal telephone system, a meeting was held at the Grand old Grantham on Friday by Mr. E. A. Sandford Fawcett, A.M.I.C.E.

A new organ in St. George's Church, Gateshead, was inaugurated by the Bishop of Durham on Monday. It is built by Messrs. Henry Willis and Son, of London.

"The Red House," recently erected for the benefit of working men in the East-end of London, was opened on Saturday afternoon. It is a lofty building on the east side of Commercial-road, and has been constructed at a cost of £10,000. It contains dining-rooms and a kitchen in the basement, a restaurant on the ground floor, a recreation-room on the "red room" for the ladies on the first floor, &c., on the second floor, and dormitories above. Provision is also made for a coffee-room, a library, and a reading-room.

The school board for Morecambe are erecting new central schools at a cost of £20,000, and at the last meeting extensions to the Bare School, amounting to £2,457, were finally agreed to.

Intercommunication.

QUESTIONS.

[1826.]—**Electric Lighting.**—Information is desired as to the average cost per incandescent and arc light for a large school, served from corporation main or by what method or price book such information can be obtained.—COUNTRY ARCHITECT.

[1827.]—**Firebricks.**—Kindly state the difference in value between the price of 1st. firebrick set in mortar and firebrick set in fireclay.—W. L. LESTER.

[1828.]—**Cement.**—Please interpret the meaning of clause in Specification, which reads thus:—All cements and ball-loads to be run with cement. Does this necessarily imply that the cement is the same? The difference between pure cement and cement and sand or small gravel is an important factor in this case.—W. LESTER.

[1829.]—**Colonies.**—I shall be greatly obliged if any subscriber to the BUILDING NEWS could give me any information regarding prospects for architects in Tasmania or New Zealand? Good all-round practitioner, used to provincial practice. Any information regarding government appointments, and how to secure, would be useful.—COLONIES.

REPLIES.

[1825.]—**Number of Fireplaces in a Room.**—We are constantly hearing rooms larger than the one named by means of one patent Manchester grate in each room fireproofed by the same means. The foregoing is a room. Please give height of same.—E. H. SHORLAND AND BROTHER.

CHIPS.

The town council of Walsall at their last meeting resolved to raise the salary of the borough surveyor from £500 to £600 a year, and the amount of the contract amounts to £1,650, the architects' estimate having been £2,000. The architects are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, W.C.

The tender submitted by Mr. John Ashley, Lowestoft, has been accepted for the Corporation of Lowestoft. Mr. Parshall, estimates the total cost of the works at £1,500. The complete equipment of the power-house and carsheds, linework, distributing system, and rolling-stock at £105,076. Of this amount £42,713 has already been let on contracts.

At the Liverpool Assizes, on Friday, before Mr. Justice Wills and a jury, the action was heard in which James Tierman, builder, of Poulton-le-Fylde, was awarded £55 damages against William Ward, and Joshua Cryer, builders, of the same place, for injuries he received in July last by being knocked down by the defendant's cart, when he was riding on his bicycle from Poulton to Carlton.

Mr. J. B. Renton, who for about five years has acted as surveyor to the urban district council of Heston, has been appointed surveyor under the Wickham Urban District Council. Prior to going to Heston Mr. Renton was assistant surveyor under Jarrold Corporation.

A Local Government Board inquiry was held at Wolverhampton yesterday (Thursday) into the application of the town council to expend £5,232 for the provision of houses for the working-classes.

The post of assistant mechanical engineer to the Clyde Trust, in its mechanical engineering department at Dalmuir, recently advertised, elicited replies from no fewer than 400 candidates. The choice of the trustees has fallen on Mr. Daniel Fyfe, who has been hitherto in the employ of Fleming and Ferguson, shipbuilders, Paisley.

The result of the poll which has been taken at Birmingham upon the General Powers Bill of the Corporation was declared on Friday. The votes recorded for the Bill numbered 2,907, and against 5,419, or a majority against the Bill of 13,822. Only a little over 8 per cent. of the burgesses had taken the trouble to vote. The Bill will, of course, be dropped. It was proposed to spend about one million sterling in the extension of the gas undertaking, and in the extension of tramways. The opposition came mainly from residents in the Edgaston and Harborne wards, who resented the proposed introduction of tramways.

The sales at the Estate Mart last week showed a marked falling off, due to the approach of Christmas, and many lots were left unsold. The total value of the property only realised £36,519.

The Tees Valley Water Board at their last meeting approved the altered plans and amended schedule for the Long Newton reservoir, rendered necessary by the numerous and extensive beds of sand which had been encountered in cutting the trenches. The alterations will involve an increase in cost of nearly £100,000.

LEGAL INTELLIGENCE

CLAIM BY A CIVIL ENGINEER.—**HUBBARD V. FIELDING.**—In the King's Bench Division, on Friday, before Mr. Justice Wright, sitting without a jury, the action of "Hubbard v. Fielding" came on for hearing. The plaintiff was Mr. W. Ashdown, a civil engineer, residing at 10, St. John's-street, Basil Fielding, of Hillywell, Flintshire. The plaintiff claimed £35, balance of money due to him for services rendered in connection with the opening up of the chalk works at the Mounts, in Kent, where the defendant was a partner. The defendant had refused to pay the plaintiff, and had refused to refer the New Globe Cement Company, and plaintiff was engaged to prepare plans for tramways and wharves on the Thames for the transport of the chalk to barges. The works were to cost £14,000, and the defendant was to advance the money. The plans and services rendered during ten months in 1899. Defendants pleaded that the plans were not of that detailed character which would enable any contractor to act upon them. Eventually the case was referred to a jury, it being decided to refer the matter to an engineer.

FORBES' "COUNTERFEIT" ACTION.—CHARLES Kennedy vs. LLOYD.—At Birmingham Assizes, on Friday, Saturday, and Monday, Mr. Justice Kennedy and a jury tried an action brought by Mr. Charles Kennedy against Mr. Lloyd, a well-known architect practising in the same city, the plaintiff being Edward John Charles and James Lloyd Forbes, and the defendant, Frederick William Kennedy. Mr. Kennedy, K.C., and Mr. Lloyd were for the plaintiffs, and Mr. Lushington K.C., with Mr. H. Stubbins and Mr. Cramer, for the defendant. Mr. Young said the libel consisted of the part of the plaintiffs was an attack upon their right to practise as architects, and the defendant made against the plaintiffs was that in their position as architects they dishonestly possessed themselves of his plans and ideas with a view to making a profit, and Mr. Forbes had put them forward as their own. Mr. Forbes had associated himself with Mr. Young for the express purpose of a very large unletting out of which would produce a profit. A block of buildings extended from the Colonnade Hotel and ran down to Lower Temple-street, and right round to the back. Many of these buildings were of considerable age, and included the Theatre Royal. Some of these buildings, and erecting a new theatre and new buildings. It would soon be an accomplished fact. Among those who took the matter up was a Mr. Bolton, who was well known to a large property in the city. He had known Mr. Forbes for some time, and approached him on the matter. An idea occurred to Mr. Bolton and Mr. Charles, which, he should have thought, would occur to any architect. The idea was to erect a new block. In the first place one would naturally think of putting another theatre on the site. There were also a hotel and restaurant and three licensed houses, and a cinema. The idea was to erect these. It was also desirable where there was such a great depth that there should be an arcade running from the bottom of Bennett's Hill to the corner near the station, so as to form a convenient short cut and a new station. Mr. Charles and Mr. Bolton Long before Mr. Forbes knew anything about the defendant's scheme this question of the arcade was mentioned in his discussion with Mr. Bolton. He had known Mr. Forbes for some time, and at that time Mr. Bolton had not become the owner of the property, and, therefore, the matter had to be kept quiet. In March, 1900, Mr. Bolton's offer for the property was refused, and at once asked Mr. Charles to draw up more complete plans. The plans and the plans were submitted to Mr. Bolton on May 2. The idea of the plans came entirely from his brain, in discussion with Mr. Bolton, and Mr. Charles. The plans were submitted to Mr. Bolton. Certain alterations were made, and on May 12 the plans were complete. On May 16 the *Daily Mail* had an article about the scheme, and Mr. Charles and Mr. Bolton were up in the *Daily Mail*, who wrote stating that he had prepared plans for the lying out of the site in the previous July. He inclosed the plans, and in the interview, and said from what was published in the paper, and from what he knew of his plans were those referred to. Mr. Lloyd undoubtedly had prepared plans, and he had also conceived the three main ideas: the theatre, hotel, and cinema. He had also prepared plans, and he was away, and neither Mr. Charles nor Mr. Brown saw him. In July, 1901, Mr. Forbes made the alterations to the original design. In October the defendant took upon himself to make alterations to Mr. Charles in the design which he had elaborated with the assistance of his friend had stolen his ideas from Mr. Charles, and the allegation was contained in a letter written on the 10th of October, 1901, by Mr. Brown, on behalf of Mr. Bolton, replied that Mr. Lloyd was labouring under a misapprehension, as his (Mr. Lloyd's) plans had not been seen either by Mr. Charles or Mr. Bolton, and on October 10, 1901, the idea he had formed, and on October 10, 1901, the

the *Deaf-Mute* pointing out the "marvellous and striking resemblance" to his plans. An attempt was made to refer the matter to the arbitration of Mr. W. Hall, but with no result. The defendant then gave this explanation of the matter pointed out to him, but it was not convincing. He said it. The action was then brought to recover damages, but merely to clear Mr. Charles's character from the aspersion that had been cast upon it. The defendant then gave evidence. He stated that, in conjunction with Mr. Forbes, and acting on behalf of Mr. F. S. Bolton, he prepared plans for the erection of a new theatre, arcade, and other buildings on the present Theatre Royal site and in the neighbourhood. He said that he was not defendant's plans. He had not seen any plans drawn by the defendant until that trial was commenced. In cross-examination by Mr. Lawrence, the defendant admitted that he had been in the place with Mr. Lloyd in October 1898, and that the suggestion was made that Lloyd might collaborate with him, he acting as builder and Lloyd as architect. Defendant might have construed from the evidence that Lloyd was not a partner in the scheme, but he did not mean him to do so. He (witness) was too jealous of his own position with Mr. Bolton. Mr. Lloyd really thrust himself upon him, and witness endeavoured to stall him. He said that he had seen some of the plans prepared, Mr. Charles disavowed from the view that they both embodied a circular place, with a dome. Defendant's was not a dome, but simply a circular place with a slight rise. Again, witness said that defendant's plans allowed for two shop and two entrances to the theatre, his allowed for two shops and one entrance. At this point his Lordship interposed, pointing out that it really mattered little whether there was one or two entrances to the edifice. The allegation was that the witness and Mr. Forbes stole the defendant's plans. One had to right, because things looked very alike, to accuse another person of stealing them. James Edward Forbes, who was a partner in the business, was a defendant or his plans when theirs were produced. Although there was a general idea of similarity, there was no justification for saying one was copied from the other. In cross-examination, he stated that he was not a partner of Mr. Charles, but that they were working under an agreement. Mr. Robert Brown, manager for Mr. Bolton, said the defendant sent some plans to Mr. Bolton, but witness had not seen them. He said that he was not a partner, that there was no case to go to the jury. Plaintiffs, said to be trading in co-partnership, alleged that they had been defamed in their character as architects. They could not have a character as architects, because they were not architects, and they were not partners, and they had not produced any agreement of their relations. He held that in order to maintain a joint action there must be something which concerned them jointly. On the other hand, the court said that the plaintiffs had been injured in their individual reputations, and in the business in which they were engaged. In reply to his Lordship, he expressed surprise that the plaintiffs should have taken in reference to plaintiffs as a firm. He was quite content to take the allegation upon them as architects carrying on business. A long legal argument followed with regard to the plaintiffs suing as individuals, and the court said that if there was no partnership they ought to be non-suited. His Lordship replied that he should ask the jury the question whether, assuming plaintiffs were partners, the words were slanderous. He gave his opinion that the words were slanderous, but on particular, so as to include the defence of "fair comment," in reference to defendant's letter to the press. In his address to the jury, Mr. Lawrence pointed out that the defendant had engaged in 1899 to prepare plans for the Theatre Royal building scheme. There was, counsel urged, no ground for saying defendant was wrongfully defaming anyone when he suggested that his ideas had been taken. He said that the defendant had been in the room for the plans he had prepared, and which were in the custody of Mr. Brown. In the witness-box defendant again asserted that he honestly thought his plans had been stolen, and he said that thought so. He said that the defendant had been in the room, and thought there was a great similarity between that and his own. Mr. Young: Did you mean to insinuate that something had been taken from your client, and that it was a marvellous and striking resemblance. I wanted to give credit for my plans being earlier in the field. Mr. Young cross-examined defendant concerning Mr. Brown's statement that defendant sent the plans to Mr. Bolton. He said that he had seen them on June 15, and that they had not been seen by him or Mr. Bolton. His opinion was that the plans were seen by Mr. Bolton, but he could not say whether Mr. Brown was a partner, but he meant the public to believe that he was the originator of the idea, and that it had been appropriated by Mr. Charles. Mr. Young admitted that the plans were not submitted to Mr. Bolton, but he said that he was honestly impressed with the idea that somebody had

copied his plans. His Lordship said he had no doubt that the development of this site was, so to speak, a thing discussed wherever architects, surveyors, builders, or company promoters met, and he did not doubt that the public spirit and private enterprise of the great gentlemen who were engaged in discussion as to how it was to be done. The Judge also pointed out that circumstances necessarily limited the scheme, and prevented the carrying out of the grandest of the possibilities. He stated that Mr. Lloyd's plans were produced before, and discussed by, several gentlemen at Mr. Murray Phelps's office in February 1901. Mr. Brown, who was well known, was present and saw the plans, and gave a prominent place to the one also called for the defendant to testify as to the similarity of the plans in dispute. One gentleman said he had never seen two from different people so similar. Another gentleman said that the one plan was "practically a facsimile of the other," and gave his opinion that there could be half a dozen different schemes in respect of the site. In 1902, Mr. Brown, who was, of course, a witness, admitted that the letters were not libels, and never could have been intended as such. He pointed to the wonderful similarity of the plans, and asked the jury to say what Mr. Lloyd wrote was a matter of common sense, and that he was not guilty of any malice in the matter. Mr. Hugo Young also addressed the jury. The idea that his plans had been copied might come into any man's mind; but he said that the defendant was not to be treated as a gentleman to accept the explanation if there were no proof the other way. That Mr. Lloyd had persistently refused to do so. Mr. Young, continuing, asked the jury to visit damages on Mr. Lloyd's head for the harm done to him by the defendant's coming in this cowardly way into court to justify his conduct, however he was misled. If, by their verdict, were not to give such damages as justice required, the defendant's character would not be cleared. Defendant had every chance to withdraw what he said, but he had not done so, still urging that he thought his plans had been copied. Counsel concluded by saying that the defendant had to remove the foul aspersion upon the plaintiffs' professional reputation. His Lordship, in summing up, stated that plaintiffs were suing practically for the harm done to them by the defendant's plans being written to Mr. Bolton, and to the Press were libellous and defamatory. The defendant had chosen to say that the words were not defamatory, and unless justification was pleaded in plain English, the plaintiffs might be obliged to accept the benefit of such a defence. What was the meaning of the letter written to Mr. Bolton before defendant had made any inquiry of plaintiffs? If it was a mere inquiry, it was not libellous. If it was professional malice appropriated for his own advantage the brainwork of another? Was a statement suggesting that defamatory or not? If it was defamatory, there was no justification. If not, the defendant was not to be treated as a gentleman that defendant accused plaintiffs of having appropriated that which was his, it was for them to say whether it ought not to be a matter for such reasons as they might be able to show. The jury, in their opinion it was a charge which ought never to have been made, and for which an apology ought to have been offered in the most open manner unless the writer was prepared to justify it. The jury awarded Mr. Lloyd £50 damages, and Mr. Forbes £25.

A BREMINGTON CONTRACT DISPUTE. In the King's Bench Division, on the 12th inst., before Mr. Justice Wright, sitting without a jury, the action of S. Mason, Ltd., of Dale End, Birmingham, against W. H. Stephens came on for hearing. The plaintiff company claimed for breach of a building contract. Plaintiffs had first been employed under sub-contracts by Mr. Hayward, builder, in executing certain work in connection with the erection of the Hotel Metropole at Southend—a large structure of 100,000 sq. ft. of floor space. The defendant Hayward got into difficulties with his mortgagees, and the work was taken over by defendant, who entered into an agreement with the plaintiffs for the completion of their work. The hearing of the case was adjourned to the 19th inst. for the purpose of completing the evidence. The plaintiffs claimed under the contracts. Defendant denied liability, and there was a counter-claim in respect of alleged non-compliance with the terms of the contract. After hearing expert evidence, his lordship gave judgment in favour of the plaintiffs on the claim and counter-claim with costs.

IN RE JOHN BATHURST.—The bankrupt traded as a timber merchant and ladder manufacturer at Hammersmith, under the style of J. Bathurst & Co., Ltd., a private company, and a sitting for public examination was ordered for Wednesday. The statement of affairs showed total liabilities £17,000, of which £7,319 was returned as expected to rank, and estimated net assets £3,518. Examined as to certain bill transactions, the bankrupt said that in some cases the bankers were aware that the bills were accommodation bills. In one case he had drawn a cheque in favour of "Smith," in order to assist the acceptor

of an accommodation bill to meet such bill. The cheque was drawn in that name so that the bankers should not know that the cheque was to be used to meet the bill. The fictitious name was used to conceal from the bankers the fact that they held on to the accommodation bill. The examination was closed.

MAIN ROAD ABRICTION IS EAST KENT.—At the meeting of the Dover Council for 1901-2, it was reported that the arbitrator appointed by the Local Government Board to settle the dispute between Dover Town Council and the Kent County Council had made his award. The claim was for £10,000 for the two years 1899 and 1900, and the deduction made was for 1899, £239 13s. 6d., and 1900 £302 14s. 3d., making a total of 1632 7s. 9d., leaving a balance of £9,367 3s. 11d. to be found by the county council. It had not yet been determined what these deductions referred to, but they principally related to the claims for scavenging. The Kent County Council, the deputy town clerk said, did not deal with Dover as it did with other places in the county. It agreed with other places that the payment for scavenging was not to exceed two-thirds of the cost of scavenging for the year, but Dover was excepted, although they were perfectly willing to accept two-thirds, and if it had been there would have been less than £10,000, so that if they had agreed with the county council they would have £30 more than they now did. The award in regard to the wood-paving was that the cost—£1,503—was to be spread over ten years, and to be paid by the annual rate of £150.3s. by the county council. Each party was to pay its own costs.

POWER TO LICENSE TEMPORARY STRUCTURES.—**MAYOR OF WESTMINSTER V. LONDON COUNTY COUNCIL.**—In the King's Bench Division, on Monday, judgment was delivered by the Lord Chief Justice of England (Mr. Justice Darling, sitting in the Court of Appeal), in the special case, an application of the Mayor, Aldermen, and Councillors of the City of Westminster under section 29 of the London Government Act, 1899. The case raised an important question in connection with the erection of temporary wooden structures which may have to be erected along the route of the procession upon the occasion of the Coronation next year, the point being whether the County Council or the Westminster Corporation be the proper authority to give the licenses. The question originally arose out of the structures erected to accommodate spectators at the late Queen's funeral, in February last, and the opening of Parliament in person by His Majesty the King on the 14th inst. The Corporation had also applied to the forthcoming opening of Parliament and the Coronation Procession. The claim of the officials of the City of Westminster was that, under the London Government Act of 1899, the administration of this matter within their area was handed over to them, inasmuch as the structures were wooden structures within section 84 of the London Building Act of 1894. This section of the Building Act, the powers under which formerly were in the County Council, had been subsequently handed over to the Corporation of Westminster, applied to the erection of special and temporary buildings and wooden structures, and provided that no person should set up any wooden structure except hoardings, within any street or area, more than 12ft. in height, without having first obtained for that purpose a license which must contain conditions as to the nature of the structure, the time for which it was to be permitted to continue, and the place at which it was to be erected. On the other hand, the County Council contended that the structures in question had not come under that section, but under section 83, which also applied to temporary buildings, and that the structures now in question, and which were erected in February last, were constructed of wood, except the nails and some of the other fastenings of the cloth or other hangings placed upon them, and that they had not been erected in any street or area, but in an open area. The case also stated that questions having arisen between the two public bodies as to which was the proper authority to act under the London Building Act, the Court was asked to say which was the proper authority to (1) to continue, or license, the structures referred to, and (2) to take proceedings against the persons who had, without licensed permission or approval, erected them. The Court was also asked to say further whether such structures were or were not subject to the provisions of section 82 of the Act of 1894, which gave powers to the district surveyor under the Act. Mr. Maunsie, K.C., and Mr. Craus appeared for the Corporation of Westminster, and Mr. Horace Avory, K.C., for the County Council. The County Council, Mr. Maunsie submitted, that section 82 of the Act of 1894 took the place of section 56 of the Metropolitan Building Act, 1855 (18 and 19 Vict. c. 122), except that the word "structure" was introduced into section 82. Section 83 of the Act of 1894 took the place of section 12 of the Metropolitan Building Act, 1852, except that it introduced the word "structure," and section 84 of the Act of 1894 corresponded to section 13 of the Act of 1852. These structures, he said, did not come within section 13 of the Act of 1852, because they were of a temporary character. Section 84 of the Act of

1894 extended section 13 of the Act of 1852 by dealing with all structures. These were wooden structures within section 84 of the Act of 1894. Section 200 dealt with a person who failed to observe the conditions of these powers, and transferred the City of Westminster. Section 84 of the Act of 1894 dealt specifically with structures. He referred to "Venner v. McDonnell" (1897). Mr. Avory, for the London County Council, contended that the powers of these powers were transferred to the City of Westminster, the district surveyor would still have to report and inspect. A further difficulty was that many structures such as these were iron and not wooden, and, therefore, would be outside of jurisdiction. The object was that the structures should be not dangerous. The only way to make these sections work harmoniously was to make section 84 apply to such structures as wooden sheds put up for any purpose at the front or back of a house, and meant to last for some years, such as a bicycle shed. Formerly a building must either have complied with the Act of 1855, or under section 56 of that Act the Metropolitan Board of Works might have sanctioned an iron or other building. It was found that with nothing dealing with any construction other than a building. It was found that, having sanctioned it, there was no power to deal with it, and therefore power was given by section 12 of the Act of 1852. The Act of 1852 was intended to embrace buildings under section 12 of the Act of 1852 and structures of a temporary character. Section 83 of the Act of 1894 was a code applying to all structures of a temporary character. Section 84 was not other words, but a code applying to all structures of a temporary character, such as a bicycle house. Section 82 applied to buildings, iron or otherwise, meant to be permanent. There was power to dispense with Part 6 of the Act under section 83, because it was not intended to be permanent, in addition to a building and would therefore come within the general provisions of the Act if section 83 did not apply. Under sections 102 to 114 dangerous structures must still be dealt with by the district surveyor, and the City of Westminster Council. The Lord Chief Justice, in giving judgment, said: The broad question is whether the London County Council or the Corporation of Westminster is the proper authority to lay down the rules for and to sanction the construction of wooden structures which have to be erected upon the occasion of public functions taking place within the City of Westminster. It is quite impossible to deal with every case and every case is different. The question is whether the question is raised with regard to structures made wholly of wood except the nails. We do not propose to lay down any general rule. In my opinion the first and second questions were asked. The first question was answered in favour of the City of Westminster. During the arguments the history of the legislation has been given. Before the passing of the Act of 1894 there were a series of enactments placing buildings and structures under the jurisdiction of the Corporation of Westminster, represented by section 82 of the Act of 1894. Sections 12 and 13 of the Act of 1852 are replaced by sections 83 and 84 of the Act of 1894. Section 84 of the Act of 1894 reproduces section 13 of the Act of 1852, and section 83 of the Act of 1894 relating to movable and temporary structures, and section 84 applies to wooden structures except certain hoardings and builders' erections. It is impossible to accept the argument that section 84 is intended to apply to permanent structures. The question is what class of structure falls within sections 82 and 83 as distinguished from section 84, because the power under section 84 is license and the power under section 83 is enforcement. The question is whether Westminster. So far as we can express an opinion (without, as I have said, expressing a general one) I think sections 82 and 83 were intended to apply to buildings or structures obviously intended to come under Part VI of the Act of 1894, because of the mode of their construction or use it was thought that Part VI was inapplicable. Section 84 seems to give control over wooden structures to which no substituted provisions of a general character would be applicable to the structures of 1898, the powers under section 84 of the Act of 1894 are transferred to the City of Westminster. I was anxious to learn whether Mr. Avory could tell us what powers would be transferred to the City of Westminster under section 84, which he addressed to us was right. All he could suggest was powers with regard to a permanent wooden structure intended to remain, but added on to some other structure. In my opinion the contention that section 84 of the Act of 1894 is right. With regard to the third question, we do not answer it. It is not necessary for our judgment, and would only be an expression of opinion. I think that the City of Westminster is the proper authority to lay down the rules for and to sanction in regard to these particular structures. Mr. Justice Darling and Mr. Justice Channell concurred.

The late Mr. James Brooks, F.R.I.B.A., has left property valued at £5,771 7s.

Our Office Table.

The discussion on the effects of trade-union restrictions on the output of workmen in the building industries has been reopened in the *Times* by letters from Mr. William Woodward, A.R.I.B.A., and Mr. H. M. Minton-Senhouse. Mr. Woodward urges that in London during the past fifteen years the cost of labour on the brickwork, the joiners' work, the plasterers' work, and the engineers' work has increased by 25 to 30 per cent., although bricks and mortar, deals and battens, lime and hair, and iron and steel, as raw material, have not materially risen in value. Further, he mentions that quite recently on a large job the bricklayers' labour and the plasterers' labour were ablet, with the result that everybody concerned was satisfied, and the cost of the respective work per rod and per yard was exactly what it was 20 years ago. In conclusion Mr. Woodward asserts that trade-unionism has had its day; that the public is entitled to live in its true character, and that the British workman is not one half the better for all the increase of wage and the lessened hours of labour which trade-unionism has secured. Further that limitation of output will not benefit trade: that 25 per cent. put unnecessarily upon the cost of building will not increase the number of the spending class. Mr. Minton-Senhouse, on the other hand, says that trade-unionism "amount to the most oppressive form of tyranny that one workman can exercise over another."

Not only is there an animated battle of the sites in progress at Liverpool with reference to the proposed cathedral, but a section of the Evangelical party in that city are renewing their opposition to any large expenditure on building operations. At a conference of the Toxteth Park Rural Deanery, on Thursday night, the 12th inst., Canon H. Woodward, rural dean, who presided, said that the organisation committee appointed to promote the erection of a cathedral for Liverpool desired to further this costly work by enlisting the active co-operation of the rural deaneries. He was conscious of the inadequacy of the present small cathedral church, and was willing to help good causes in great and substantial structures, and that he was anxious to accommodate 5,000 or 6,000 persons, where no temptation would be afforded to mar the simplicity and spiritual reality of devotion by Mediaeval or historic ceremonialism, the entire cost of which need not exceed £50,000 to £100,000. Such a cathedral standing on the site of the present one could be completed in a very few years. He did not see his way to resist in carrying out the present scheme. The chapter of the deanery had elected Canon Irving, the Rev. H. Gresford Jones, and the Rev. C. G. Postance to watch over the interests of the deanery in association with the organisation committee. After a rather animated discussion three laymen were appointed on the committee.

The Light Railways Act of 1896, which was only a tentative measure, expires during next year, when, if not renewed, promoters will be obliged to proceed under the provisions of the well-known Tramways Act of 1870—a permanent measure. This explains the activity of those interested in electric traction and the promotion of schemes for consideration in the next session of Parliament, and the official announcement made this week that the President of the House of Trade has appointed a committee, consisting of Sir Francis Hopwood, K.C.B., C.M.G. (chairman), Sir John Edward Dorington, Bart., M.P., Chairman of the Gloucestershire County Council; Colonel Sir Herbert Jekyll, R.E., K.C.M.G.; Mr. Arthur Thring, Mr. Jeeves, town clerk of Leeds; Mr. Sydney Morse, and Mr. George White, to consider and report on the House of Trade has appointed a committee, consisting of Sir Francis Hopwood, K.C.B., C.M.G. 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An official invitation to tender for the construction of the Ponteland Railway has been issued by the North-Eastern Railway. The line is to be constructed from north of Gosforth Station to Ponteland village in Northumberland. The tenders are to be lodged next month.

LIST OF COMPETITIONS OPEN.

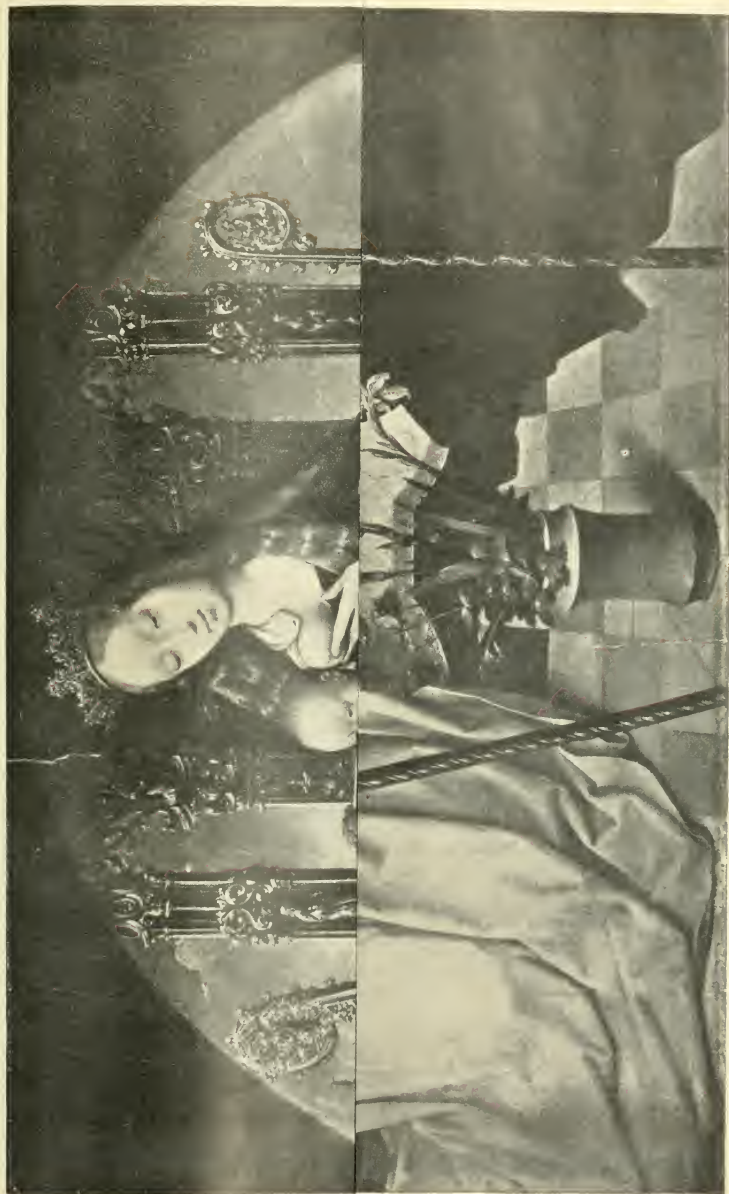
Gillingham—Laying-out Sixteen Acres as Recreation Ground..	£20, £10, £3	F. C. Boncher, Clerk, Gardiner-street, New Brompton, Kent	Jan. 1
Kirkcaldy—Science and Art Schools (400 to 500 places)		Alexander Beveridge, Clerk toburgh School Board, Kirkcaldy	15
Kirkcaldy—Elementary School, 400 places		Alexander Beveridge, Clerk toburgh School Board, Kirkcaldy	15
North and Sutton, North Dublin—Water-Supply and Drainage Scheme		John O'Neill, Clerk, Board-room, North Brunswick-street, Dublin	20
Newcastle—Isle of Wight—Queen Victoria Monument	£50	The Secretary, 20, Holroyd-road, Newport, Isle of Wight	24
Hull—Art School, limit £10,000 (Assessor, Sidney R. J. Smith, F.R.I.B.A., 14, Work Buildings, W.C.)	£100 (merged), £60, £40	F. Laverack, Town Clerk, Town Hall, Hull	21
Bateman—Working-class Dwellings (three types)	£50, £25, £10	The Town Clerk, Municipal Office, Laverack Hill, S.W.	21
Glasgow—Dwellings for Poorer Classes, Alexandra Park	£100, £50, £25	Sir J. D. Marwick, Town Clerk, City Chambers, Glasgow	Feb. 1
Mountain Ash Municipal Offices £30,000 limit	£75 (merged)	John Williams, Surveyor, Town Hall, Mountain Ash	4
London—Blackburn—Fluorid Epileptics and Idiots' Colony (Assessor)	£200, £150, £100	H. Woodhouse, Clerk, Chorlton Union Off., All Saints, Manchester April 4	
Melbourne, Aus.—Statue of Queen Victoria (Marble or Bronze)		The Agent-General for Victoria, 15, Victoria-st., Westminster, S.W. May 1	
Liverpool Cathedral—Drawings of Designs or Executed Work	3000s. each to Architects in Final Competition	The Hon. Secretaries, Church House, South John-street, Liverpool, June 30	
London, N.W.—Tractor for Military Purposes	£1,000, £750, £500	The Secretary, Mechanical Transport Committee, War Office, Horse Guards, Whitehall, S.W.	(1901) Jan. 1
Tilkey—Baptist Church and Schools		The Rev. W. Jones, Secretary, Hope House, Heben Bridge	1
Northampton—Boarding-House and Playing Field (cost £5,000), Billington	No first, 25gs.	J. Haviland, Clerk to Governors, 8, St. Giles-square, Northampton.	—
Chiltherton—Baptist-ruled Schools		J. Whitehead, Clerk to School Board, Chiltherton, Oldham	—
Northampton—Laboratories, &c. (cost £4,000), Abington-sq.		J. Haviland, Clerk to Governors, 8, St. Giles-square, Northampton.	—
Leigh, Lancs—College Hospital	£50, £20, £10	J. H. Cox, Hon. Sec., Williams Deacon's Bank, Leigh, Lancs.	—

LIST OF TENDERS OPEN.

BUILDINGS.

New Tredgarn, Mon. Corrugated Iron Hospital	Bedwellty Urban District Council	Jno. Alex. Shepard, Clerk, Town Hall, Tredgarn	Dec. 21
Bradford-on-Avon—Workhouse Bathroom	Guardians	James Charnock, Clerk, 16, Margaret-street, Bradford-on-Avon	21
Openair Cottages		A. Whitwell and W. White, 25, Temple-row, Birmingham	21
Berwick-upon-Tweed—Infant School	School Board	J. L. Nicholson and F. E. Dobbin, Architects, Newcastle-on-Tyne	21
Reading—Electric Power Station	Corporation	John Bowen, A.M.I.C.E., Borough Engineer, Town Hall, Reading	21
Alva—Police Station		John Melvin, Alva, A.M.I.C.E., Glasgow	21
Chatteris, Cambs.—School	School Board	W. Wren, Mount Pleasant, Cambridge	23
Hargrave—House and Stable		Adkin and Hill, Architects, Prudential Buildings, Bradford	23
Bradford—Addition to Shop, Caroline-street		P. J. Thomas, Architect, Bradford	23
Southend-on-Sea—Forty Houses for Working Classes		Alfred Fidler, A.M.I.C.E., Borough Surveyor, Southend	23
Alva—Double Cottage at Monmouth		A. W. Reid and Witter, Architects, Elgin	23
Malmesbury—Technical and Secondary School	Educational Committee	Robert E. Brinkworth, Architects, Gloucester, Wilt	23
Cork—Mans.	Baptist Chapel Trustees	Robert Walker and Son, Architects, South Mall, Cork	23
Southampton—Library Buildings		O. T. Heywood, Secretary, Public Library, Southampton	23
Bradford—Addition to Shop, Caroline-street		P. J. Thomas, Architect, Bradford	23
Manchester—Mason's Shed at Corporation Yard	Dwelling Committee	The City Surveyor's Office, Town Hall, Manchester	23
Brede—Two Cottages, Cuckfield-street	Corporation	P. H. Palmer, M.I.C.E., Borough Engineer, Town Hall, Hastings	23
Fontenay-trail—Block of Six Houses, St. Luke's-road		Fisher and Sons, Architects, Club Chambers, Post-pool	23
Bradford—Gannow District Baths	Town Council	The Borough Surveyor, Town Hall, Burnley	23
Upton-by-Chester—Cottage Home	Chester Union Guardians	T. M. Lockwood and Sons, Architects, 60, Foregate-street, Chester	23
Northampton—New-constructing Doncaster Parish Church		G. F. K. Young, Architect, 42, Tay-street, Perth	23
Dulverton—Court House and Police Station	Somerset County Council	W. J. Wilcox, County Surveyor, 1, Belmont, Bath	23
Glasgow—Eastern District Hospital, Duke-street	Parish Council	John Baxter, I.M., 213, St. Vincent-street, Glasgow	23
Burlington—Branch Stores, Victoria-road	Co-operative Society	Clark and Moseup, Architects, Feetbarns, Darlington	23
Coodpoeth—Minister's House		W. Lloyd Jones, Architect, Bangor	23
Morley—Stabling, &c.	Synagogue Committee	F. Putnam, A.M.I.C.E., Borough Engineer, Town Hall, Morley	23
Lancaster—Carshed, Turnbuck-street	Tramways Committee	T. Chan Hughes, Town Clerk, Town Hall, Lancaster	23
Horton, Exms.—Fuddled Rooms	London County Council	E. W. Partridge, Clerk, 6, Waterloo-place, S.W.	23
Oban—Entrance Lodge on Dunolzie Estate		Kenneth Maer, 24, Argyll-street, Oban	23
Southampton—Alterations to Pear Tree Green Schools	St. Mary Extra U.D. School Board	George C. Candy, Clerk, Woolton, Southampton	23
Erdington—Pavilions, &c., at Workhouse	Anton Union Guardians	A. Whittell and W. White, 25, Temple-row, Birmingham	23
Roddy—School	School Board	L. Lawrence and Son, Architects, Newport, Mon.	23
Newburgh-by-Sea—Sixteen Cottages		T. W. Welsh, Secretary, Co-operative Stores, Newburgh-by-Sea	23
London, S.E.—Sorting-Office, 288, New Cross-road	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	23
St. Boleas—School	School Board	R. T. Kistell, Architect, 1, George-street, Plymouth	23
Hanley—Homes for Little Sisters of the Poor		R. Scrivener and Sons, Architects, Hanley, Staffs.	23
Dewsbury—Covered Market, Cruckfield-lane	Yaycepham Urban Dist. Council	W. Harpur, M.I.C.E., Borough Engineer, Town Hall, Dewsbury	23
Portsmouth—Improvements to Market Hall	Leeds Corporation	Morgan Thomas & Co., 20, Bank-place, Portsmouth	23
Newcastle—New Building	Leeds Corporation	Edwin T. Hall, F.R.I.B.A., 54, Bedford-square, W.C.	23
Edinburgh—City Hospital Extension	Midlothian County Council	Maximilian Henry, Architect, 7, South Charlotte-street, Edinburgh	23
Ashington—Isolation Hospital, Low Black Close	Urban District Council	Alexander Wood, Surveyor, Market-place, Ashington, Morpeth	23
Bedford—Infant School at Kingland	School Board	R. E. Friedland, Clerk, Bradford House, Holyhead	23
Cardiff, Car Road, N. Newport	Corporation	W. Harpur, M.I.C.E., Borough Engineer, Town Hall, Cardiff	23
Cwmefryn—Infants' School (200 places)	Alverstrath School Board	R. L. Roberts, Architect, Abercromby	23
Plymouth—Enlargement of Post Office	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	23
Alva—School	Clydebank School Board	W. W. Partridge, Clerk, 6, Waterloo-place, S.W.	23
Bury, Lancs.—Central Tramway Depot, Rochdale-road	Tramways Committee	Arthur W. Bradley, A.M.I.C.E., Borough Engineer, Bury	23
Styal, Cheshire—Cottage Houses (20 children)	Anton Union Guardians	Jas. B. Broadbent, A.E.I.B.A., 15, Cooper-street, Manchester	23
Leeds—Six Houses and Shop, Thorpe-lane		A. Whittell and W. White, 25, Temple-row, Birmingham	23
Hull—Restaurant and Shop, King Edward-street	Co-operative Wholesale Society, Ltd.	A. Neill and Son, Architects, 38, Park-road, Leeds	23
Belfast—Villa at Whitehead		A. E. Wilson, Estate Agent, 22, Waring-street, Belfast	23
Cardiff-on-Tyne—Three-story Stabling, W. Blandford-st.	Dean and Chapter	E. H. Hartley, A.R.I.B.A., 25, Queen-street, Manchester	23
Sutton, Co. Dublin—Two Houses	School Board	G. F. Beckett, Architect, 97, Stephen-street, South Dublin	23
Antwerp—Three Houses, Biogate-street		W. J. Jennings, Architect, 42, St. Margaret-street, Canterbury	23
Wombwell—Eight Houses		John Robinson, Architect, 10, Victoria-street, York	23
Rotherham—Temporary School (200 places)		James E. Knight, Architect, College-street, Rotherham	23
Broadstairs—House, North Foreland Estate		W. H. Woodhouse, A.R.I.B.A., 32, High-street, Southwark, S.E.	23
Irishbridge—Alterations to West Wharfage, Fenian	Ironbridge & Coalbrookdale Co.-op. Ry	W. J. Jennings, Architect, 42, St. Margaret-street, Canterbury	23
Blackburn—Extensions to Norfolk-street C.E. Schools		Stones and Stones, Architects, 10, Richmond-terrace, Blackburn	23
Wombwell—House		John Robinson, Architect, Wombwell, Wks.	23
Larne, Ireland—Laharna Hotel		Albert Gordon, M.S.A., 24, The Crescent, Manchester	23
Derby Church, Shaftesbury-resort	Mrs. Francis Ley	P. B. Ridgway, M.S.A., Architect, Long Eaton	23
Bradford—Additions to Warehouse, Church Bank Buildings		H. Hardaker, Architect, Ivygate Chambers, Bradford	23
Sheffield—Two Pairs of Cottages		Colson, Farrow, and Nichol, Architects, 22, New-street, Manchester	23
Long Eaton—Three-story Factory and One-story Factory		John Sheild, Architect, Darley House, Long Eaton	23
Darwin—Eight Houses		M. Woods and Thackeray, Architects, Darpo	23
Walsley—Clunney (240)		S. P. Bidder and Co., 45, Blackfriars-street, Manchester	23
Burgess Hill—Refectory London-road Boys' School	Clayton and Keymer School Board	Botham, M.E.A., Architect, 228, Queen-street, Brighton	23
Southend-on-Sea—Two Shops, Heygate-avenue		Greenhalgh and Brookbank, Architects, Bank Chambers, Southend	23
Erskine—Pair of Cottages, Wesleyan Chapel and Schools		F. Foster, Architect, Leamington	23
Penarth, N.W., Victoria-road		Seldon and Carter, Architects, Bank Buildings, Cardiff	23
Marple—National Schools		James Hunt and Son, Architects, 4, Warren-street, Stockport	23
Hull—Rebuilding Tally Ho, Bond-street	Moore and Robson's Breweries	Freeman, Son, and Gaskell, Architects, 11, Carr-lane, Hull	23
Ingelton—House		S. Worthington, Whetstone Hall, Ingelton	23
Rhyl—Mansion on Sea Front		Clayton and Black, Architects, 122, North-street, Brighton	23
Northgate, Canterbury Schools (1,020 places) (St. John's-pl.)	School Board	The Ryth Brick Co., Ltd., Links-road Works, Ryth	23
Forres—Cunning-street 1100 Feet Church		W. J. Jennings, Architect, 42, St. Margaret-street, Canterbury	23
Hamington College—Seventeen Cottages		Ross and Macchett, Architects, Queensgate Chambers, Inverness	23
Forbes, Peasey Bridge—Wesleyan Chapel and Schools		Stewart Barnard and Co., Ltd., A. Exchange Buildings, Newcastle	23
Newcastle-on-Tyne—Pulling Down, &c., Freshwater Church		E. J. Morley and Son, Architects, 228, New-street, Bradford	23
Cardiff—Six Houses, Garden-street	T. Hingworth	Benjamin F. Simpson, F.R.I.B.A., 12, Grey-st., Newcastle-on-Tyne	23
New Hyr, Ryndale—Garden-street		Guise and Liddington, Architects, Godey-street, Col. Oxford	23
Aldwick, Bognor—Bungalow		John Sellers and Sons, Architects, Union Chambers, Bury	23
Rothwell—College Hospital		Hall, Cooper, and Davis, Architects, 10, Gray's Inn-square, W.C.	23
		E. N. Cubitt, Architect, Brentwood, Essex	23

John S. Brodie, A.M.I.C.E., Boro' Eng., Town Hall, Blackpool	Dec.	21
J. Read, A.M.I.C.E., City Surveyor, Guildhall, Gloucester	"	21
H. W. Smith, Boro' Engineer, Town Hall, Castle-road, Scarborough	"	21
Richard Bacon, Town Clerk, Oxford	"	21
J. Read, A.M.I.C.E., City Surveyor, Guildhall, Gloucester	"	21
W. Fleetham, Cashier, Wingate Grange Colliery, Durham	"	21
Alfred Fidler, A.M.I.C.E., Borough Surveyor, Southend-on-Sea	"	23
Francis J. C. May, M.I.C.E., Town Hall, Brighton	"	23



Photographed by Franz Hanfstaengl.

VIRGIN AND CHILD, BY ALBERT DURER.
FROM WINDSOR CASTLE.

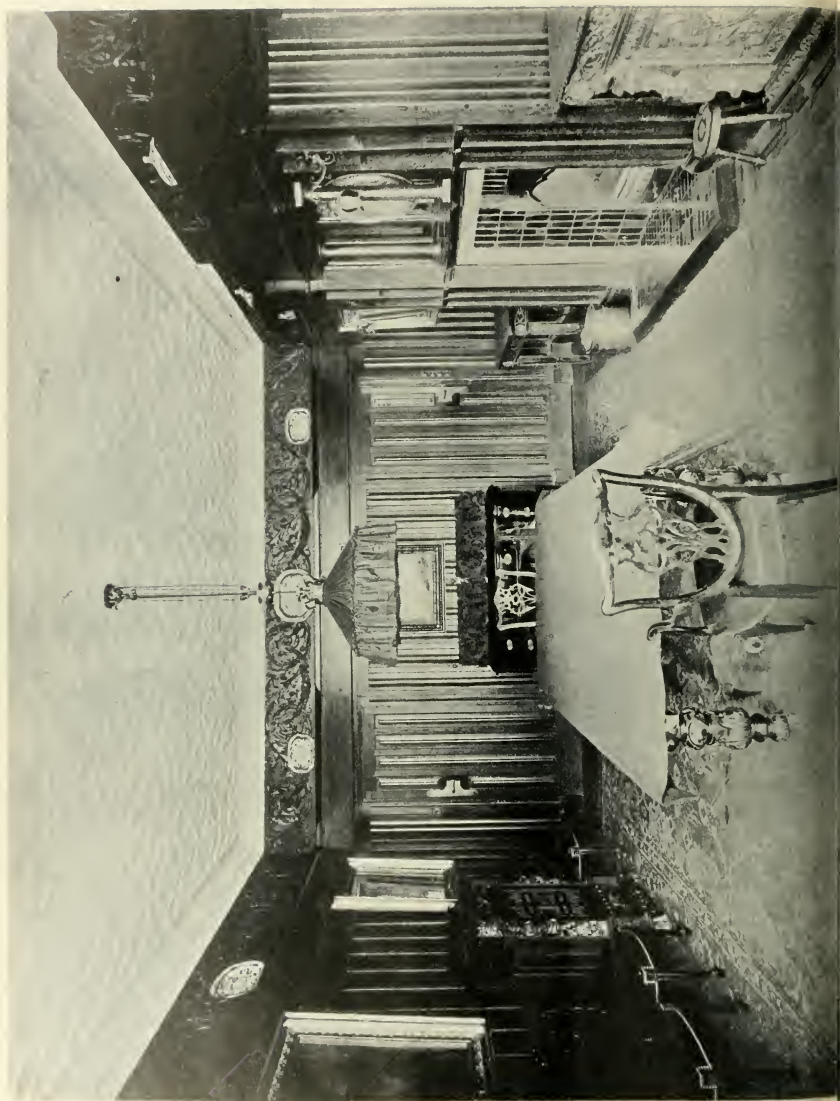
The Picture is still in England. C. 1540.







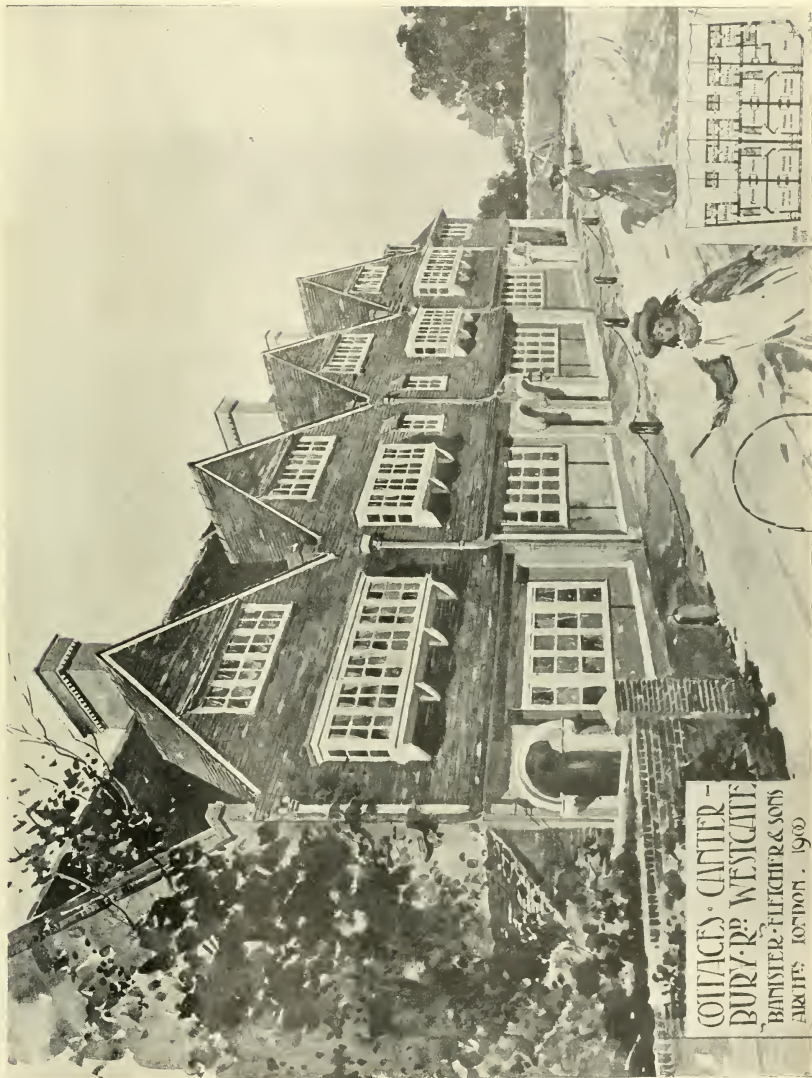
"KINGS GARDENS," HAMPTSTEAD.
PALGRAVE AND CO., ARCHITECTS.





THE DINING ROOM AND STAIRCASE, "ABBESS GRANGE," HAMPSHIRE.

BANISTER FLETCHER AND SONS, ARCHITECTS



COTTAGES - CANTER -
BURY - WESTGATE
BARNES - FLETCHER & SONS
ARCHTS. LONDON. 1900

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXXXI.—No. 2451.

FRIDAY, DECEMBER 27, 1901.

CONDITIONS FOR COMPETITION.

MODEL competition conditions are rare. Before professional assessors were appointed to assist committees in drawing out their instructions, the ordinary printed forms were hopelessly misleading, and many competitions ended in complete failure from the want of any well-considered proposals or definite ideas as to what was wanted. The competing architects worked in the dark. Someone with more foresight than the rest produced a good plan, which was accepted, or ignored for another grievously at fault, accompanied by a more attractive exterior. But we had hoped that this state of things had come to an end when professional assessorship and conditions were introduced, but our hopes have been somewhat disappointed. With greater precision and method have arisen not a few difficulties. One is the interpretation to be put on the clauses of the instructions. The assessor may have an idea of his own as to a certain arrangement or relation of parts, and he embodies this in a clause; but the competitors read it in different ways, and their plans show various arrangements. The schedule gives the areas for certain rooms in the building, and their situation may be hinted; but the exigencies of planning determine some of the competitors to show a smaller area, or to make the length and breadth of the room of a proportion not adapted to the requirement, or perhaps to provide two smaller rooms of combined equal area. The result is not satisfactory. Again, the assessor, having a preconceived scheme in his mind, is likely to bind competitors to conditions that will not work out well. By some error of judgment, certain arrangements or areas or rules are laid down that cannot be worked to. We could recall instances of this in many competitions, in which questions of boundaries, of ancient lights, of entrances were left to the competitors to solve in the best way they could. When the plans were completed, and the assessor had to advise upon them, the man who had done the best thing in the circumstances was placed first because he had boldly altered or modified the original conditions, while some competitor whose plans were in conformity with the conditions, therefore meritorious, was ruled out of court. Thus a too-easy compliance with conditions that are not practicable often creates disappointment and injustice to all competitors. Has not this been the case with a few of our large municipal buildings competitions, the results of which have given dissatisfaction to many who have scrupulously followed the instructions? The appointment of an expert is not always satisfactory, particularly when such an expert-assessor has a "fad" for some particular arrangement or development. For instance, we can imagine an assessor employing on plans of a large municipal building going so far as to select a particular design because it adopted a clever scheme of offices for the water department, or for the borough accountant, while indifferent about a design which showed clever grouping of offices as a whole, and good entrances. The acoustical properties of a hall may, in another instance, be considered a reason for selecting a set of plans with a large assembly hall. What we mean to assert is that the expert often sees things out of true perspective. He has little sense of true proportion, and when he has a large number of designs before him he is very apt

to select those designs which favour one department or feature at the expense of the merit of a general scheme, in which departmental knowledge is combined with good entrances and corridors, lighting, convenience, and architectural proportion. In designs of a specially technical character such as a hospital or a set of baths and washhouses, there is the danger of the expert looking at things rather askance; as, for instance, the details of a ward, rather than the general plan of pavilions, or the administration offices, or mechanical plant rather than the scheme. In baths and washhouses too much attention may be expended on the arrangement of the washhouse and laundry department, or on a few technical points. The assessor's report often lays particular stress upon parts of the plan to the exclusion of the equally important matters of convenient corridor communication, entrances, good lighting, and grouping. To take a concrete example:—In large municipal buildings it is one of the principles of good arrangement that the officers of one department or staff, say, the town clerk's or surveyor's, should be grouped round the general office or private corridor giving access to the several offices, avoiding the necessity of any of the staff entering the general office every time he has to go to another member's office. But such a principle is likely to be obscured or lost sight of if the assessor is intent on some other point equally necessary, but of lesser general importance.

The conditions are often misinterpreted from the want of seeing exactly eye for eye with the assessor. An examination of competition designs, all prepared from the same instructions, reveals many remarkable differences. It is curious to find a variety of different methods or treatments for such a matter as entrances and positions of rooms. The most perfect conditions leave certain questions indefinite and indeterminate, as we may see in such a competition as that just settled for the Camberwell Baths and Washhouses. In this case over one hundred questions were received and replied to by the Council of the Borough of Camberwell or the assessor, clearly proving that the conditions were not very definite on certain points. These points refer to the by-laws, area of site, special entrances to large bath and second-class bath, situation of the private bath, the washhouse, the gallery of large hall, cold-water storage, boilers and machinery, and a variety of other things about which competitors were in the dark. From the queries given it would appear the instructions were not very explicit. Referring to the details specified for swimming-baths, one querist asks whether they "are depths of ponds or of water." Another point which was misunderstood was the number of tiers of seats in the gallery. The schedule spoke of a gallery "with, say, three tiers of seats of sufficient width and pitch, &c.," but it was found that according to the London County Council requirements three rows and a gangway would make a greater width than necessary. The consequence was that some competitors have had to adopt two tiers instead of three. This is a sample of the kind of misunderstanding which often occurs in competitions under the new régime. Can we explain the apparent paradox? Professional assessorship has done a great deal to remove the ambiguity and uncertainty of the old competition instructions, but we find a large correspondence kept up between the competitors and the assessors as to the meaning intended to be conveyed by the conditions. We have tried to explain the anomaly. But architects themselves who go into competitions are not blameless. If the assessor or expert adviser has his own prejudices and fads, so the ordinary competitor labours under disabilities. He knows little of the subject perhaps—technically speaking—and every move he makes he does so with much

difficulty. If it is a schedule of area, he is not certain whether he may exceed or reduce the dimensions with safety; he feels his way hesitatingly, not having a grasp of his subject. We can at once distinguish plans by such an author; they are often full of careful execution and detail; ceilings are delineated for the sake of filling up spaces, and making a weak plan look full of work, when a stronger plan is drawn in simple lines and washes. The entrances are generally long straight corridors without any real grasp of the requirements; a lot of space is wasted, the offices or large rooms and halls are tentatively laid down with little regard to axis or grouping—often they are put the wrong way. No ingenuity is shown in arranging entrances, vestibules, or accessory rooms to make the best of the area. Such is the timid competitor. There is also the bold speculator who takes his scheme on some enterprise—a prodigious hall and staircase, occupying a large portion of the ground floor, or some equally bold stroke of planning that does not aim so much at compliance as effect; or it may be the boundaries of the site are altered to suit the plan, or a large light area is thrown into the building. There is the man who has a trump card to play, others who have not. He knows something of the building required, and leads off with a good entrance arrangement, or a well-devised suite of rooms or a private, but often fails in some minor appointments that are essential to a successful plan. Both the bold and timid competitors are to some extent made by the conditions. A bold stroke is often the result of vague instructions, the impatience of trying to obtain any clear notion of what is intended, and the same indefiniteness makes the unskilled and nervous hesitating. Men with no definite knowledge or aim are therefore timid and faltering in their work;—they are afraid to advance a step beyond what has been laid down; while others of more independence and knowledge are bold, but often venturesome, or ignore the conditions for the sake of their own. In this the latter overshoot the mark. The one kind of competitor produces a weak, faltering kind of plan, the other a scheme that either exceeds the requirements or surpasses the intentions of the promoters. The published conditions have to control and regulate both classes of men. They should therefore be sufficiently explanatory to meet the want of knowledge of the one, and concise and definite enough not to give reins to the imagination, nor to encourage any attempt to introduce innovations or faults of the author. The indefinite instruction is generally the most objectionable on this ground; it induces all kinds of invention in planning, very vague guesses of the right size and position of departments, entrances, and modes of lighting. A perfect set of conditions is, perhaps, unattainable; but it should try to state and formulate the requirements without hampering the competitor. If possible, it ought to suggest positions for rooms and departments, modes of entrance and light, and to leave the rest to the designer—unless, of course, a certain arrangement is compulsory. Alternative schemes should be permitted when there is nothing to the contrary. On the other hand, the instructions referring to entrances, lighting, boundaries, the absolute requirements of machinery, or anything that is compulsory and cannot be altered, ought to be clearly stated, and it is a good plan to introduce such decided instructions in italics or red ink.

At the beginning of the present year, the Institute drew up amended "Suggestions for the Conduct of Architectural Competitions," which will be found in our first volume for the year. Certain revisions were made in the "Suggestions," one of which referred to the appointment of one or more professional assessors and their duties. The duties are "to draw up the particulars and conditions (as far as possible in accordance

with the promoter set forth in those suggestions as the basis of his competitors, and advise upon the design submitted, to let him know what the design is, and to the instructions, and to exclude any which do not; to advise the promoter on the relative merits of the designs submitted to the competition; and to make a selection in accordance with the conditions." These clauses have important bearings. It places all competition conditions and instructions in the hands of a professional man, and it presumes that he brings to his task a definite knowledge of the scheme and experience. He should have been engaged in similar work, and understand the questions that are likely to arise in the minds of the competitors; he should have gone through the competition "mill" himself. Beyond this, he should, as we have said, be free from prejudice, and be prepared to consider each design on its own merits, not to throw it aside because one matter has been neglected that is not the most important. To properly perform this work requires preparation, and the only way to draw up a series of conditions more or less exact is to make a rough plan to scale of the requirements, to understand thoroughly the site and boundaries, rights of light, levels, entrances, &c. In no other way can a perfect set of conditions be drawn up. For instance, to take a large and irregular site for a municipal office, it would be impossible to formulate a reliable schedule of accommodation and areas without calculating the area of the site, allowing for necessary areas for light and air. On the basement, ground, and first floors all the chief official departments, public rooms and suites of apartments, and committee-rooms must be placed, and therefore sufficient superficies on each of these three floors must be found; the other floors are of less importance, or can be partly roofed over. Space must be allowed in such a calculation for the vestibules, hall staircases, and corridors and light areas to be taken out before the net area can be ascertained. A plan to scale can only enable these areas to be found. We sometimes think this is not done, but rough guessing is resorted to. One of the frequent queries made by competitors is that the scheduled area cannot be obtained, and asking for advice. The assessor ought to be able, from knowledge, to be sure of his data before he draws up the conditions. The levels, inspection of the site, the best sides for entrances, the best frontage for the principal rooms, are other points about which exact knowledge is required. Secondly, to "determine whether the designs conform to the instructions and to exclude any which do not," is equally a great responsibility, involving the best judgment for weighing and adjusting varying degrees of merit. An assessor who does up the instructions ought of necessity to be the best judge of the degrees of compliance to them, or how far each designer has carried out his idea; but it is, alas! not always so. We have often seen the most distinct condition ignored in a plan that has been awarded the first premium, and some quite different arrangement made. It may be better if often, and the assessor is a bold judge to set aside in his own position for another and unapproved plan, or the deviation may be so small in which case those who have carried out the instructions have a greater reason to protest. Having fixed the condition, we do not see how the assessor can justifiably select a plan that violates it, even if it is an improvement, without injustice to those competitors who have closely followed the instructions. We have, indeed, seen competitors to whom the best plans have not been given, and to the premium. There must be something extraordinary in the conditions, or the assessor must be ignorant or explain them in some manner. Words are not to be taken too literally, and a plan may be found to be the promoter's idea, and a useful fixed plan. These suggestions, however, could be put to the assessor, and the assessor to find out

what was necessary in the preparation of the plans in pencil, the replies to be published at the same time for the benefit of all the competitors? By this means all would be placed on the same footing, and it would not cause delay by replies coming in after many of the authors had completed their plans.

MUNICIPAL TASTES.

THE attitude of municipal bodies towards architecture was made the subject of a suggestive and interesting lecture at Owens College by Mr. Reginald Blomfield, published in our last issue. The lecturer spoke of the necessity for a wider and more intelligent education, and offered some suggestions on that behalf. It will not be denied that municipal bodies have more important functions to discharge in architectural matters than anyone else. They represent the average public in their requirements and aspirations, the ratepayers, and as such they express, however unworthily, the public taste in building. Our town-halls, corn exchanges, markets, public libraries, asylums, schools, baths, and washhouses are works that represent the industry, progress, and taste of the town at its best. We cannot compare our modern municipal architecture with that of the old Medieval cities in France, Belgium, or those of the Low Countries where the rival municipalities vied with each other in the erection of palatial town and trade halls. We have nothing that we can show to compete with those of Bruges, Ghent, Brussels, or Ypres, except those of quite modern erection at Liverpool, Leeds, Manchester, Birmingham, Bradford; yet all these structures, erected at great cost, represent the taste of the revivals in Classic and Gothic, and are mainly examples of building by the leading men who adhered to those traditional styles. They do not embody to us as the Middle Age edifices do, the art and craftsmanship of guildsmen, but rather the best modern architecture of the Revival that could be produced by the contracting builder at the lowest cost. We are also compelled to admit that the average of architecture in our great cities is very low; but the architect is not entirely to blame—the fault was, as Mr. Blomfield says, with the bodies who employed the architect. These representative bodies are naturally not the best material to draw from. As their main duty is to protect the interests of the overtaxed ratepayer and reduce the rates, all expenditure on buildings and architectural embellishment is cut down to the lowest figure. So there is some excuse for their neglect, if not for their non-appreciation of art. The average town councillor is usually a tradesman of small means, and his education and environment have not in any way conducted to art instincts or culture. He is, therefore, completely ignorant of architecture as an art, if he is extremely alive to cutting down builders' prices, and can make himself heard on questions of drainage, &c. Members who have better and more advanced tastes are few, and, of course, in the minority, and their influence has no weight. This is really, in short, a fair description of the provincial corporation;—the one or two men in it who would like to see buildings erected worthy of the town and its industry have no voice in selecting architects or designs. Mr. Blomfield might have alluded to another aspect of municipal parsimony to illustrate his thesis. He might have shown that quite a large percentage of municipal buildings of one kind and another are designed and carried out by the surveyor or engineer of the borough council, and this for a practical reason—in some cases to save unnecessary expense in offering premiums to architects. We are not here saying many of these buildings are not a credit to the surveyor and the

town; in not a few buildings we have seen they exemplify all that honest architecture for offices, markets, libraries, asylums, and baths, and other kinds of official building could represent, in which practical common sense and substantial building are combined. But there are, unfortunately, a larger number of them that exhibit a desire to exceed these limits, and to lavish upon the structures ornament and detail of a kind that is a reproach to the art, besides an unnecessary expense to the ratepayer. Local building committees often welcome expenditure and display when they have the control over designs, which they would sternly oppose if a party in the council succeeded in appointing an outside architect. Localism and personal pique are often detrimental to the best interests of architecture in our towns.

In the provincial town the average town councillor or county councillor regards architecture as a kind of luxury to be paid for. They look upon it with something of the same feeling they look upon old paintings or china—as something chiefly concerned with taste, as an amateurish kind of thing that can be bartered for, or made the subject of party politics in the matter of style. Mr. Blomfield laid much to the charge of the dilettante taste of 150 years ago, when noblemen dabbled in design and connoisseurs amused themselves in various artistic hobbies. When municipal life began to revive about half a century or more ago, there were two or three styles contending for supremacy in the field, and corporations had to select a style they thought the most suited. It was a matter largely of sentiment and party feeling—one party advocated Greek or some Classic style, another party took the safe Gothicism, and we know the conflict that took place when any public building was contemplated. It was not a question of good plan or honest expressive architecture, but one of styles, that was considered; it was the era of the battle of contending parties, in which the two parties of the town council took sides. Nothing could have been more unfortunate for architecture, as Greek or Gothic came to be looked upon as the empty shibboleth of a party. The public of course looked on the dispute with amusement and contempt, for they knew little or nothing of the merits of either style; but they began to consider architecture as they would old china, or anything which was simply a question of taste, and the architect as a raconteur of old styles or as a mere archaeologist, and ever since the profession have had to bear the reproaches. From Walpole, who dabbled with architecture as an amusement, down to Ruskin, who threw in all his enthusiasm and genius for a certain phase of art, we have, it is truly observed, been labouring under the delusion that architecture was a dead and obsolete art, instead of one dealing with the practical necessities of the present day. While we have been under this delusion the public have been left completely in ignorance, except what they have imperfectly learned from the pages of Ruskin and other popular authors. We have now thrown off much of the sentiment and poetical description that attached to architecture in the writings of Sir Walter Scott and Ruskin, when it was really regarded as a literary accomplishment, and have begun to see the art as allied to construction, and as based on the absolute requirements of modern life. Yet the old ideas still linger; those who direct the affairs of municipal life and advertise for designs assume that style is still a power; that if they select a style they will obtain what they want, as the Liverpool Committee did in the case of the proposed cathedral when they named Gothic. The idea of fixing a style, and then expecting to get what they want is still a notion that has to be combated in the interest of the profession. Mr. Blomfield observes that laymen had, first of all, lost their bearings

in architecture; and, finally, had lost their interest in it, as being an art of no serious bearing on the immediate concerns of life, and therefore to be dealt with according to the fashion of the time, without regard either to first principles or to the teaching of the past. This habit of mind has been reflected in the conduct of the various leaders that represented the public. The history of public competition for town-halls and similar buildings erected in this country during the last fifty years was too painful to go into." He also spoke of the "asylums that disfigured a whole countryside with their deformities, and town-halls that brought their cities to shame," but the lowest note of vulgarity was reached in our public parks and gardens. No one can deny that our town-architecture is at a very low ebb. We can show, however, some improvement; it is useless to deny that a few of our later town-halls and offices are a credit to the cities in which they are built. Our illustrations have given examples of buildings which are instances of homely and expressive work. But the mischief is still lurking in the public official mind, that when they erect a building it must be something to look at and be talked about by the general public—a building that will look well reproduced in the illustrated papers, and we all know what such a standard of taste means. It means a good deal more than a well-planned convenient building, one attractive externally rather than severely honest—in fact, an edifice combining palatial dignity of style with the requirements of a public office.

It is not what the profession can give, but what the public through their officials ask for. Honest architecture is not yet wanted: the profession have to supply a mixture, not the genuine article, and it is the same in all other trades with which artistic taste has anything to do. The London County Council is perhaps the greatest and most enlightened municipal body; but it has neither the power nor the ability to decide on any great scheme of architecture for the new thoroughfares that are being opened. Are we to have a repetition of Northumberland-avenue or Charing Cross-road?—a number of palatial hotels and offices of a given style or of several styles; or a design worthy of the position, and designed by men who put honesty and art expression before the mere blandishments of style? All our municipalities are in the same difficulty; they do not understand architecture, or they would all demand it; but they ask for buildings that are "up-to-date," something that can be labelled Italian, or French Renaissance, or Gothic, and so on. That is sufficient, and the profession are ready to supply what they want without demand, and would be suicidal for the profession to be over-scrupulous. We have numerous examples of modern municipal buildings all over the country that exhibit the kind of art that is popular, some of them by no means bad or devoid of good planning or detail, but representative of some style of Renaissance, Italian or Flemish or English—some very clever adaptations of Late Gothic, like the new town-hall at Lynton, with its half-timbered fronts, all very meritorious examples of modern architecture, yet still retaining the traditional idea of conforming to style.

The remedy for this condition is only to be found in a more educated public sense of art. Direct school teaching will do little by itself, for all school instruction is mainly based on nomenclature, or classification of some kind, historical epochs, facts and styles, and memory is the faculty by which it is taught; technical training must be the root-basis of a more logical architecture; but this training is necessarily confined to the profession and the crafts. It is the public that have to be taught to form a truer estimate of good art than they have now; to deal more with ideas

and things than with their clothing; to pay more attention to the reason of things than their antiquity. Our schools of art have implanted something in this direction, by exhibiting designs based on material and utility, and it can only be by good examples of art in the midst of the material that taste can be raised. When the public mind and its representative bodies begin to realise that practical building functions, of however prosaic a nature, are not to be separated from true architecture, there will be some hope of a new and higher sense. We may then begin to see our public offices, courthouses, markets, libraries, workhouses, and county asylums truthful and expressive buildings without the pretence of a thin veneer of architectural decoration that is no architecture at all. The workman's model dwelling in our towns need not be the bare prison of brick walls and apertures for light and air, if the true conditions of health and happiness be sought for. It has been said that "every country has the Government which it deserves." If so, our municipal architecture is only what the public can tolerate; but it is the duty of those in authority to improve the circumstances and conditions of those who live and work in our buildings by making them more susceptible to a better environment.

"BUILDING NEWS" DESIGNING CLUB.

A COUNTRY SCHOOL FOR MIDDLE-CLASS BOYS.

IN this contest "Grip" ranks first, "Punaise" second, and "Uno" comes third. We illustrate all three of these designs to-day. The whole of the plans submitted were very creditable; but the above are, on the whole, undoubtedly the best. School provision, and to be clear at once, being more and more directed towards the accommodation of Secondary and what is termed Middle Class needs. The future—and that at no distant date—will witness a far greater development in this respect, and architects will, it is to be hoped, be well prepared to deal with work of this kind in a more advanced and generally artistic manner when it comes into their hands. As to how far the accompanying designs may be said to be precisely suited for such purposes may be a matter of opinion, and critics, before passing an adverse judgment upon the plans thus presented, will do well to remember that these essays of our designing club are intended to be clear and that students' designs made for mutual study and improvement, though we shall not be far wrong in asserting that many a suggestion and idea has been picked up by more experienced readers of the *BUILDING NEWS* from the published plans produced by some of our Designing Club members.

The following were the conditions printed for the direction of competitors:—"A small Country School for middle-class boys in a stone district. The site faces the north-west; therefore some of the chief rooms will overlook the playgrounds to the rear. The accommodation is for forty boarders and, say, a dozen day-boys, and a head master's study and a w.c. attached. The attached are two dormitories and two bedrooms for two resident assistant masters on the first floor. The schoolroom to be 50ft. by 25ft., and have four classrooms about 15ft. square opening out of same, and also one piano music room. The dining-room to be associated with the master's residence, and he will have six bedrooms in the master's house, and also a bathroom. A good staircase and airy entrance-hall for the schools are essential, and facility of supervision is of consequence, as also compactness of arrangement. The style must be suitable for stone and plain, but picturesque, without elaborate features. Mullioned windows and stone-sloped roofs. The competitors must decide the further details of the plan themselves and the proportionate sizes of the rooms, for which dimensions are not herein given. The site is level, and the building is to stand in its own grounds. The plans may be to scale of 1/4 in. to

foot, if eighth scale is found too large. The latter to be used for two elevations and a section. A small sketch of the walls, frieze, and windows, if required, will be an advantage. Size of paper 24in. by 18in.

"Grip" adopts a quadrangular plan with considerable ingenuity, giving a southern aspect to the living-rooms of the master's house overlooking the little quad. The main entrance to the school opens into a spacious vestibule with the head's study immediately to the right for the interviewing of the pupils, and the main entrance, who on coming into the schoolroom see it to the best advantage. A door into the isolation vestibule dividing off the music-room from the schoolroom would be a convenience, so that the music-room might be used as a cloakroom for visitors on reception days. The classrooms and assembly-hall are kept distinct from the rest of the premises, and the locker-room, hats and coats, &c., furnish this accommodation just where it is needed; but the bathroom ought to have been placed on the first floor, and we do not quite like the lavatory and w.c. so close to the master's sitting-room, even if they are screened by a door. The schoolroom is so placed as to be conveniently served from the kitchen, the latter department being well kept together with its offices and yard. The kitchen also serves the head-master's house nicely. The stairs the arrangements are well considered, say that the bath-rooms are below. There is a passage front of the master's house and the dormitories for easy supervision and emergency. Architecturally, the exterior is suitable, and if a trifle wanting in distinction, the author has observed a quiet restraint, and knows how to emphasise a little colour by contrasting the ground-floor stonework with the first-floor brickwork, while his new of gables elevates the N.E. front would look to the best advantage.

The second design, by "Punaise," is quite a different scheme, and its author has tried an experiment not without some degree of success; out, like most attempts of a like character, it has its drawbacks which present self-imposed difficulties, such as a more ordinary scheme would avoid. The octagonal tower, which is the basis of the design in the form of a circular tower, with a gallery above, and ceiling light at the junction of the wing with the main building. The arrangement of the master's house is not an ideal one, but all the parts are well lighted. The music-room is absurdly small, and the head-master's study awkwardly cluttered up with its porch. The bathrooms are omitted from their proper place near the dormitories, and the latter are not very good with the lavatory basins in the sleeping apartments. The second bedroom for an assistant master is a poor little room in the roof. The exterior has some clever features, with a series of picturesque gables, and the value of health and contrast of form. The drawings are worked out nicely, and executed neatly, with a firm and direct style of delineation.

The third design, "Uno," is broadly handled, with a good sense of the picturesque, which we do not hesitate to acknowledge. His plan has several good points, and the master's house is compact and convenient. We think it is always a mistake to put a w.c. over a front door. "Uno" does not show what becomes of the soil-pipe. His entrance-hall is none too light, and the corridors leading from it are darker still. The music-room would be very nice, but the head-master's study, somewhat to the discomfort of his family. The cloakroom is very small, and no place for boys' lockers. The dormitories are hampered by lobbies, and the lavatories are very restricted. The passages do not seem to make a good feature in this plan. It is not a nice arrangement to locate the bath-rooms so close to the servants' bedroom. "Uno" draws the sash-bars in pale ink, which will not reproduce well—the same black ink should be used throughout.

"Young Craftsman" would have obtained a higher position if his drawing had been more reasonably delineated, for his design has much to commend it, both for its artistic external treatment and for its arrangements, which are worthy of better illustration. The author must not blame us—indeed, he describes his perspective as "A fidgety sketch," with no points found, and it was done, he says, when he was fagged out. He adopts a free-hand line throughout his elevations, accompanied by a rough and free mannerism, which gives a poor effect even in the original, and therefore it would be most unsatisfactory if reproduced. The great hall has an open-timber roof and large mullioned windows, on the north-east facade; the classrooms are at the end. The

per part is fitted with an organ gallery, and the dormers come right and left at the ends of the hall, with a master's room between. The music-room is well isolated, and the refectory is well placed, and so is the master's house, though externally this is the weakest part of the scheme, looking thin and commonplace. "Young Craftsman" need not become mechanical; he will never probably be that, but he must try to work more seriously. It is difficult to judge "Not a home," design, because it is so long in its proportions that the sheet is not long enough to take the elevations. There is merit, however in his work, with ample fenestration and a variety of gables. The plan shows loss of space in corridors, and rather a crude contrivance of rooms. "Rex" imparts rather the character of a board school to his building, but his plan displays a knowledge of the requirements, though one w.c. upstairs for the required number of boys is not enough for the needful accommodation. The locker-room is spacious. The school arrangements are good, but the wall and passage of the master's house would be very dark, and we do not like the entrance-hall of the school. "Carlton" uses three sheets of paper, so that if we wished to illustrate his design, it would be necessary to cut up his sheets, and hence a difficulty of rearrangement for publication. The master's house is needlessly isolated from the school, and the plan is not compact enough for so small an institution. In several respects, however, the scheme is well thought out, and the exterior is unpretentious. It cannot be described as effective, notwithstanding the breadth aimed at. "Ich Dien" is a conventional extremist in the matter of draughtmanship, and the result of his attempt can only be called ungainly and crude. He will never do good work while he follows this nightmare of mannerism. We place him thus high in the competition, because he shows, in spite of his faults, a sense of the picturesque which, if he had more real taste, would probably enable him to produce truly better things. At present he is standing in the way of his own progress. "Leek" shows care, and cubicles for the dormitories are a feature in his plan, which has a practical air about it, though in parts it is open to objection. For example, the music-room, with the master's room adjoining it, tacked on to the assembly-hall, is not a convenient arrangement. The staircase externally is distinguished by a tower with a domical roof. "Noct" is ingenious, but the principal rooms in some cases are too broken in line, and the beds in the dormitories crowd upon the fireplaces too much. The hall of the master's house would be quite dark, and the principal's room depends entirely on a borrowed light. The facades are unobjectionable, and are marked by some taste. "Brum" comes next, and marks the boys' entrance by a lofty feature like a quasi-tower, and this breaks like a long skyline. The plan is marked by study, but it is not enhanced by the dark passage on the first floor. "Viking" is compact, though the detail of his entrance and design generally is not very happy or effective. His plan is among the best; but it needs more study. The master's house is entirely isolated from the school on the first floor, which is an objection. "Jove" puts his two dormitories over the school and classrooms, the divisional wall above not following upon the walls below. The corridors are not nice, and the entrance-hall is none too light. Externally the design is not effective, being so much of the same value in its parts. "Primus" is also a careful competitor, who lacks distinction; but he gives smaller dormitors, which, though increasing the difficulty of vision, has its advantages. Like other of our dark passages, and the architectural treatment is not very good either. "Scitia" draws fairly well, and we do not object much to his design, though it merits no higher place, taking it as a whole. The master's bedrooms are nicely located for supervision between the dormitories, without being too much in evidence, like nurses' rooms in a hospital. "Giroude" is commonplace, and his plan is wasteful in land space. His dormitories are crowded, and in case of a fire the pupils in the third room would never get out. "Nob" is unpretentious and pleasingly simple with a rambling plan, in which the master's house is too mixed up with the school. The hall is very dark, and the connection upstairs between the master's house and the school is by way of a bedroom.

"Tentav" runs his building up into three floors externally by lifting up the main floor

COMPRESSIVE STRENGTH OF CONCRETE.—SERIES I.

Fig. 1.

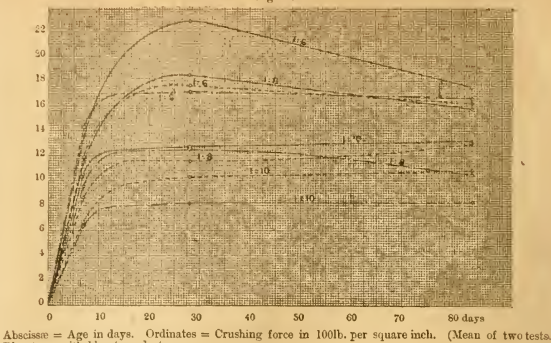
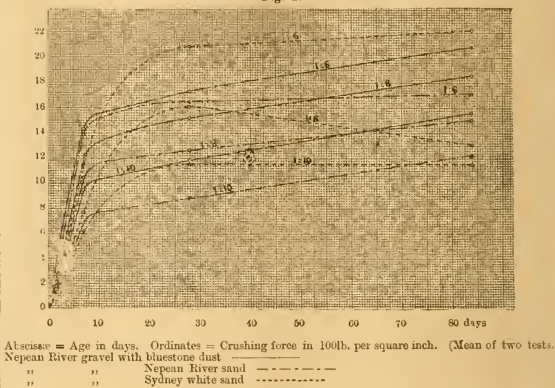


Fig. 2.

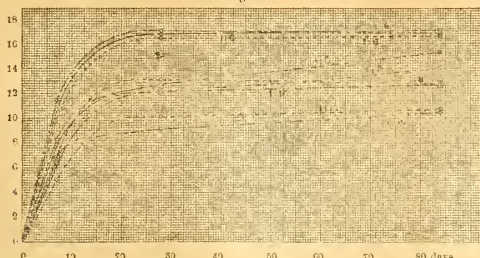


considerably. The elevations being kept in outline lack effectiveness of colour, and are designed more in conformity with brick than stone. The assembly-hall in the midst of the building would be very dark unless it had skylights, which do not appear in the plans, and the gymnasium in the basement under the hall would be excessively dark. The kitchen is below the dining-room. "Aray" has his school-room in a similar position, but his scheme is more crude, the elevations being unassuming and ineffective. "Pom Pom" is too fond of the ink-pot and overlines his elevations, which in execution would look solid and suitable. The dark passages in the plan are very bad, and the cubicles are deep narrow pens depending on dormers high above the sight level with dismal interior effect. It is not quite clear how those on the second story work in. "Ivy" is an ordinary designer not rising above the everyday commonplace of idea. His plan is straightforward, and, on the whole, well adapted to a school, though it partakes too much the type of a hospital or similar institution. The hall and landing over in the master's house are very successful, and the former would be shockingly dark. "Ping Pong" covers a lot of ground and yet gives inconvenient little air-spaces in between his buildings which in themselves are not so bad but expensive, with a large amount of space occupied by passages. Externally the design is poor. "Acacia" has shown no little

care in working out his scheme; but he occupies two sheets in doing so. We are not carried away with the result. The top dormitory over the master's house bedrooms is not good. At the same time, the master's house is isolated entirely from the first floor of the school. The outside is picturesque, but not particularly pretty. "Bruce" shows a good plan and very poor elevation. "Jaap" is of medium merit. "Wabigon" has the merit of compactness, but there is not enough dormitory accommodation. "Lethe," the first of the third degree of merit, has too small a dining-room and a strange idea of architecture. "Ingle Neuk" comes next with a long, ugly corridor in the middle of his ground floor. "Acquis Labor Nihil" makes much of a similar feature, and the windows of his fronts look too big for the wall spaces. The tower is very "Gothic." The other designs rank as follows:—"Ancient Mariner," "Clach-na-cuidin," "Clio" (with ground floor very "high"), "Koko," "Catspaw" (with a bird's-eye perspective à la Japanese), "Petrel," "Kar Kar," "Draig Goch," "Homodda," "Edina," "Jaspa," "Nell Byn," "Swan," and "Jug."

The new Roman Catholic church of St. Agnes, situated in Cricklewood, near Child's Hill Station (Midland Railway), was solemnly opened by Cardinal Vaughan this week. The church is suited for 200 persons.

Fig. 3.



COMPRESSIVE STRENGTH OF CONCRETE.—SERIES III.

Fig. 4.

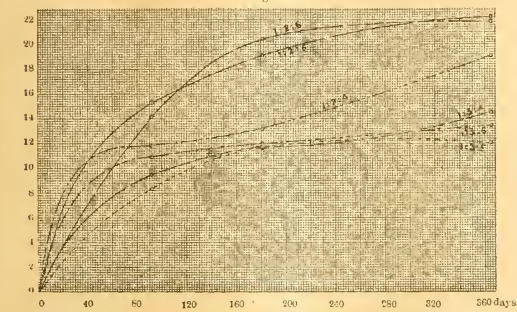
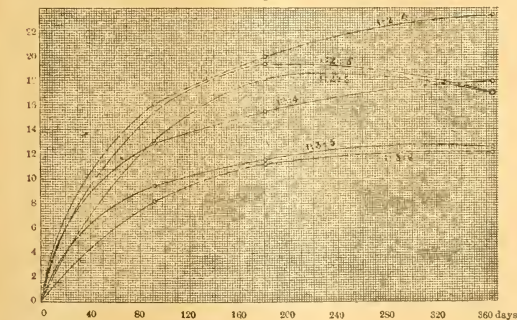


Fig. 5.



THE STRENGTH OF CONCRETE.*

By W. H. WAIDREN, M. Inst. C.E., M. Am. Soc. C.E.,
 Challis Professor of Engineering, University
 of Sydney.

THE tests described in this paper on concrete subjected to compression, transverse, and tensile stresses, have extended over several years,

and it was thought desirable to publish them for the benefit of those who are engaged in the construction of works in which this material is used. It is hardly necessary to point out that we require to know the resistances of concrete when subjected to the stresses above mentioned, in designing concrete columns, walls, arches, and foundations.

Compressive Strength of Concrete.—It is usual to determine the compressive strength of concrete by subjecting cubes of the material to a com-

pressive stress in the testing machine. The strength of a cube is greater than that of a square prism, the height of which is greater than the sides of the cube, and less than that of a prism the height of which is less than the side of the cube. In a paper on "The Strength of Brickwork" read before the Society in December, 1900, the results were given of some experiments on the compressive strength of slabs and prisms of cement and lime mortar in which the sectional area was the same in each test, but the height varied from 1in. to 12in.

Professor Hauswinger has expressed the compressive strength of prisms of different heights of the same sectional area as follows:—

$$\sigma = \alpha + \beta \sqrt{\frac{f}{u}}$$

where σ denotes the compressive strength, f the sectional area, u the height of the prism, α and β constants to be determined by experiment. For prisms of dissimilar cross-sections, he proposed the following formula:—

$$\sigma = \left(\alpha + \beta \sqrt{\frac{f}{u}} \right) \sqrt{\frac{1}{u}}$$

where u is the circumference of the cross-section. In order to ascertain the strength of concrete cubes of various proportions of cement, sand, and stone, it is necessary to prepare and test the specimens under conditions which are maintained as nearly uniform as possible throughout. Great care should be taken in the determination of the proportions of the various materials forming the concrete, and the quantity of water, so that every cube tested has actually the composition intended. This is accomplished by using the same cement throughout, also the same sand, in which the sizes of the grains are restricted by two sieves of definite sizes, as, for instance, passing the sand through a sieve of 400 meshes per square inch, and catching it on one of 900 meshes per square inch.

The broken stone used should be separated out into about three or four sizes by means of suitable screens or sieves, and these afterwards mixed in the proportions intended. The quantity of water necessary should be separately determined for each kind of concrete, and this should be weighed out and mixed, when preparing the specimens in the correct proportion previously determined. The mixing should preferably be performed in a machine for the sake of better securing uniformity.

The concrete should be filled into metal moulds having plane and parallel faces, and carefully rammed—here also a machine similar to the Bohm hammer apparatus or lever press would be advantageous. The writer generally leaves the cubes in the moulds for 21 hours covered with damp cloths, and three hours out of the moulds before placing them in water.

The testing in a modern testing machine is comparatively a simple matter if the specimens have been accurately prepared, having parallel plane surfaces between the compression plates of the machine, the bottom one of which is provided with a ball bearing. The load is gradually increased until the specimen shows some signs of yielding, such as a hair crack; the load at this point is noted, and afterwards increased until fracture occurs. The fractured cube has the form of a pyramid, the base of which is that of the cube, and nearly equal to it in height; the four corners of the cube are sheared away.

The following experiments were made by the writer on specimens 6in. by 6in. by 6in. The concrete was mixed and filled into the moulds by hand; the broken stone and the gravel used were separated into three sizes by means of screens between 2in. and 1in. between 1in. and 1/2in., and between 1/2in. and 1/4in., these were then mixed together in the proportion of 5:2:1, and the volume of the voids carefully measured. It was found that the proportion of the voids in the broken stone was 39.5 per cent., and in the gravel 31.6 per cent., so that sand was added to fill the voids in each case, and the cement was added in the proportion of 1 part of cement to 6, 8, and 10 of stone. The proportions of cement and sand entering into the composition of the mortars in the various concretes was, therefore, nearly as follows:—Broken stone concrete 1 to 2.4, 1 to 3.2, and 1 to 4. Gravel concrete 1 to 1.9, 1 to 2.5, and 1 to 3.

The gravel and blue metal Basalt was found to be practically non-absorbent, but the sandstone absorbed 2.9 per cent. of water, so that more water was necessary to make sandstone con-

* Read before the Engineering Section of the Royal Society of New South Wales, Sept. 18, 1901.

used, both in the case of gravel and blue sand. The results obtained by testing these cubes at 7 days, 28 days, and 60 days are recorded in the Table Series I, and plotted in Figs. 1 to 3 inclusively.

A series of compressive tests were also made on cubes of concrete, 12in. by 12in. by 12in., prepared by ordinary workmen from cement mixed in the same way as the screenings, Works, Armagh. They are recorded in Table Series III, and plotted in Fig. 6, Series I, from the Engineer-in-Chief for Sewerage Construction, Mr. J. Davis, M.Inst.C.E. The specimens were preserved in moist soil, and they had received the cure required, in respect to water in the Lanesborough Laboratory, where they were tested. These specimens received their curing in the ordinary way, and were superior to the others, so that the uniformity so necessary for accurate results could not be obtained. The results are, probably less than the actual strength of the concrete in the sewerage works at the same stage, they are recorded in the Table Series II, but the results have not been plotted, as they were only tested at 28 days.

A third series of tests were made in similar form, prepared in the same manner, but filled with a specially made mortar, made in the form of cubes 12in. by 12in. The results of these tests may be taken as representing fairly accurately the strength of concrete in the sewerage works. They are recorded in Table Series III, and plotted in Fig. 6, Series I, inclusive, but they are in no sense laboratory tests, as the concrete was made by ordinary workmen. Compression tests were also made on concrete prisms 3 ft. high by 12in. by 12in., made as in Series II, the results of which are recorded in Table Series IV.

7. *Transverse Strength of Concrete.* In making transverse tests of concrete, the beams were accurately supported on the end bearings and loaded in the centre, so that the beam was maintained in a horizontal position, having the three lines of contact of the end supports and central edge where the load was applied in true parallel planes. The beams were 3 ft. long, 12in. wide, and 12in. deep, prepared by ordinary workmen by filling timber moulds in a similar manner to that described for the concrete cubes in Series II.

The beams were placed upon supports in the testing machine, 27in. centre to centre, and loaded in the centre. The results of these tests are recorded in Series V., and the modulus of rupture was calculated from the following formula:—

$$f = \frac{3}{2} \left(\frac{w + \frac{w'}{2}}{b \cdot d^2} \right) l$$

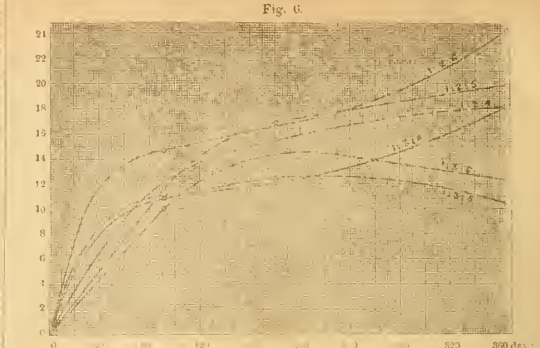
Where f = the modulus of rupture; w = the breaking load applied at the centre; w' = the weight of the beam between the centres of supports; b = the breadth; d = the depth; l = the span.

Transverse Strength of Concrete. The same concrete described in the foregoing tests was tested in tension: large size briquettes were prepared, in which the proportions were the same as in the standard English and American briquettes used in cement testing, but the smallest section was 10in. by 10in. = 100sq.in. The accurate preparation of such large specimens by ordinary workmen in timber moulds, and the subsequent testing in the machine, was by no means an easy matter, and although they were tested carefully, the results cannot be looked upon as representing the true tensile strength of the concrete in the work, as the nature of the process used in making the specimens must have rendered the results lower than would have been obtained on specimens prepared in the laboratory: they are recorded in Table Series VII.

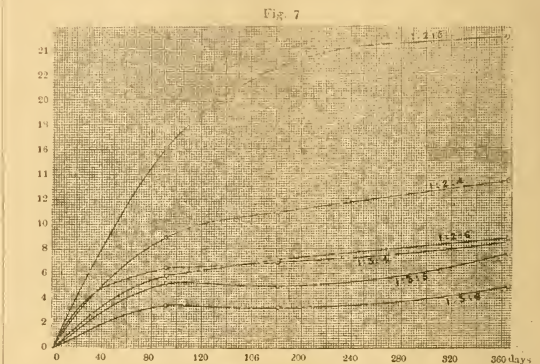
Fig. 1, Series I., shows the compressive

strength of limestone concrete of three proportions with three kinds of sand, from which it is clear that limestone dust is superior to either Nepean River sand or Sydney white sand; also the Sydney white sand comes out a little better than the river sand in this concrete. It will be observed that there is a fall in strength from 6 to 28 days, but it would probably rise again at a later period, but the tests were not carried beyond the ages shown.

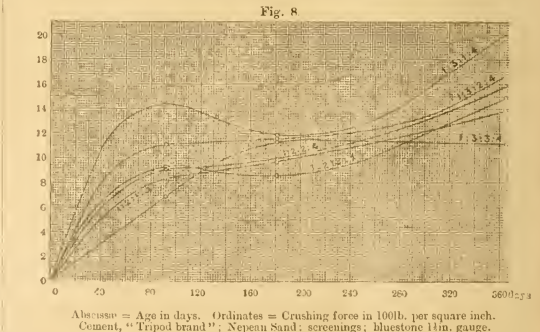
Fig. 2, Series I., shows the compressive strength of Nepean River gravel concrete of the same three proportions and the same three kinds of sand. Here the Sydney white sand is best for the 6 to 28 days of concrete, but the limestone dust is better than the Sydney white sand, and in every



Abcisse = Age in days. Ordinates = Crushing force in lb. per square inch. (Mean of two tests.) Cement, "Tripod brand"; Nepean sand; sandstone 2in. gauge.



Abcisse = Age in days. Ordinates = Crushing force in 100lb. per square inch. Cement, "Tripod brand"; Nepean sand; pebbles 2in. gauge.



Abcisse = Age in days. Ordinates = Crushing force in 100lb. per square inch. Cement, "Tripod brand"; Nepean Sand; screenings; bluestone 12in. gauge.

case the Sydney white sand is better than the Nepean River sand.

Fig. 3, Series I., shows the compressive strength of sandstone concrete of the same three proportions, mixed with the same three sands. A series of tensile tests extending over 12

Shales and Coal Stems, Basalt, Eolipathic Tuff, &c. Bathgate is built on Carboniferous Limestone, with Coal and Ironstone and Basalt. The Basalt, Basalt, Carboniferous Limestone, Aluvium, Laidlaw, Carboniferous Limestone with Coal, Aluvium, &c. The Bathgate is easily recognized by Carboniferous Rocks, the most divisions of which have representative rocks. They are everywhere invaded by igneous rocks, which are found as interbedded lavas and tuffs. The frequent occurrence of these, as well as their unusual thickness, indicate long-continued volcanic action. The intensity of which may be judged from the fact that in the Bathgate Hills the igneous rocks alone attain a thickness of 1,600 ft. The Coal Measures and Limestone and the Carboniferous Rocks of the lowest division are worked for building, the Basalt or "Whin- stone" is extensively worked all over the country for paving and road-metalling. The Coal Measures are found in the west of the county, the chief building-stone quarries being Bathgate 10 men, Faldah 21 20 men, Beachhead West 40 men, all worked by Messrs. Turner and Co. A Coal Measure Sandstone from Kingscavel was used in building Laidlaw Palace, and Coal Measure fireclay is worked for brickmaking. Carboniferous Limestone at all points from the coast at Helms to the west of Linlithgow, passing Bathgate to the county boundary, where it enters Lanarkshire. There are no important quarries in it, one of the best known, that at Bowden, really an underground working, has been under water for the past twelve months. The entire east of the county is occupied by the Lower Carboniferous rocks, viz., the Carboniferous Sandstone—the most important quarries in it being Pardovan, Philipstown, The Pardovan Freestone Quarry Co., Ltd., 11 men; Hopetoun, Winchburgh, Messrs. Armour and Paterson 22 men; and Maiden Park, Booness, Mr. T. Peattie's Trustees 12 men. Kinross Quarry is not worked at present, and that at Lindsay Craig is only worked occasionally. Hopetoun Quarry, in the hands of the Earl of Hopetoun, gives employment to two men. A celebrated quarry in this county was worked at Binny, near Uphall. The stone from it was remarkable for its weathering qualities, but it is not worked at present. The Scott Monument 1845, National Gallery 1839, and the Glasgow 1860, and other important buildings were erected with Binny stone. This valuable sandstone, once extensively quarried, is in the old shales, about 1,600 ft. under the Carboniferous Limestone, its exact position being over the Dunnet, and under the Broxburn shales. Another important Carboniferous Sandstone quarry, that at Bembie, is now closed. This stone was quarried in the local Euxine, Glasgow, and other public buildings. The Hopetoun quarries, of which Messrs. Armour and Paterson are the lessees, turn out cube stones, broad stones, long stones, &c., cubes, jambs, ashlar, courses, &c., all broad stones under 6 in. thick being dressed as 6 in., and when the breadth of a stone exceeds three times the thickness, the thickness is increased at one-third the breadth. Stones cut "parapet" are charged 10 per cent. additional. In cube stones, the length must not exceed twice the breadth, nor the breadth twice the thickness. In stones, Turner's quarries, sawn and machine-dressed stone is worked at the following prices:—Faldah and Beachhead ashlar sawn 10 in. thick, 10 ft. 10 in. dressing 10 ft. 10 in. per 100 ft. 2 in. faces, 10 ft. Ditto faces of 2 in. stones 6 in. broad or under, 4 ft. ditto 6 in. 10 ft. 10 in. broad, 3 ft. per lineal foot. Dressing and squared faces of all other sizes of stone, 5 ft. 10 in. per 100 ft. Dressing beds over 15 in. broad, 1 ft. per square foot. In Messrs. Turner's East-End Quarry, Faldah, the prices are, on the whole, a little higher than in the Faldah and Beachhead quarries. All the important quarries in the county produce and quote for stones of the following dimensions worked in the rough. Broad stones are worked from 6 ft. to 3 ft. thick, and from 8 ft. 0 in., 12 in., and 14 in. high. 6 in. is 14 ft. 0 in., 11 in., 10 in., 18 in., 2 in., 22 in., 24 in., and 30 in., ranging by 6 in., 8 in., 10 in., 12 in., and 14 in. 3 ft. 0 in. by 18 in., 6 in., 8 in., 10 in., 12 in., 14 in., 16 in., 18 in., 20 in., 22 in., 24 in., 26 in., 28 in., 30 in., 32 in., 34 in., 36 in., 38 in., 40 in., 42 in., 44 in., 46 in., 48 in., 50 in., 52 in., 54 in., 56 in., 58 in., 60 in., 62 in., 64 in., 66 in., 68 in., 70 in., 72 in., 74 in., 76 in., 78 in., 80 in., 82 in., 84 in., 86 in., 88 in., 90 in., 92 in., 94 in., 96 in., 98 in., 100 in., 102 in., 104 in., 106 in., 108 in., 110 in., 112 in., 114 in., 116 in., 118 in., 120 in., 122 in., 124 in., 126 in., 128 in., 130 in., 132 in., 134 in., 136 in., 138 in., 140 in., 142 in., 144 in., 146 in., 148 in., 150 in., 152 in., 154 in., 156 in., 158 in., 160 in., 162 in., 164 in., 166 in., 168 in., 170 in., 172 in., 174 in., 176 in., 178 in., 180 in., 182 in., 184 in., 186 in., 188 in., 190 in., 192 in., 194 in., 196 in., 198 in., 200 in., 202 in., 204 in., 206 in., 208 in., 210 in., 212 in., 214 in., 216 in., 218 in., 220 in., 222 in., 224 in., 226 in., 228 in., 230 in., 232 in., 234 in., 236 in., 238 in., 240 in., 242 in., 244 in., 246 in., 248 in., 250 in., 252 in., 254 in., 256 in., 258 in., 260 in., 262 in., 264 in., 266 in., 268 in., 270 in., 272 in., 274 in., 276 in., 278 in., 280 in., 282 in., 284 in., 286 in., 288 in., 290 in., 292 in., 294 in., 296 in., 298 in., 300 in., 302 in., 304 in., 306 in., 308 in., 310 in., 312 in., 314 in., 316 in., 318 in., 320 in., 322 in., 324 in., 326 in., 328 in., 330 in., 332 in., 334 in., 336 in., 338 in., 340 in., 342 in., 344 in., 346 in., 348 in., 350 in., 352 in., 354 in., 356 in., 358 in., 360 in., 362 in., 364 in., 366 in., 368 in., 370 in., 372 in., 374 in., 376 in., 378 in., 380 in., 382 in., 384 in., 386 in., 388 in., 390 in., 392 in., 394 in., 396 in., 398 in., 400 in., 402 in., 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SERIES V.—TRANSVERSE TESTS OF CONCRETE BEAMS, 12 IN. BY 12 IN. BY 12 IN.

MEAN OF THREE TESTS.

No.	Description.	Proportions used in gauging.										Age in days.	Weight per cubic ft. in lb.	Breaking weight in lb.	Modulus of rupture, lbs. per sq. in.
		Cement.	Sand.	Screenings.	Stone.	Water.	Age in days.	Weight per cubic ft. in lb.	Breaking weight in lb.	Modulus of rupture, lbs. per sq. in.					
1	Cement, Red Cross brand	1	2	—	—	4	0 822	131	839	225	10	140	112	296	
2	Sand, Nepean	1	2	—	—	5	0 747	141	1804	312	10	140	1122	26	
3	Stone, bluestone, 2 1/2 in. gauge and downwards	1	2	—	—	6	0 617	142	138	786	155	10	141	1012	26
4	—	1	3	—	—	4	0 57	137	454	124	10	141	536	154	
5	—	1	3	—	—	5	0 5965	140	139	750	91	10	141	617	268
6	—	1	3	—	—	6	0 612	138	34	1616	147	10	142	7298	211
7	Cement, Red Cross brand	1	2	—	—	4	0 867	36	134	6295	106	10	134	1869	181
8	Sand, Nepean	1	2	—	—	5	0 713	32	132	2675	142	10	134	7100	195
9	Stone, sandstone, 2 1/2 in. gauge and downwards	1	2	—	—	6	0 654	32	132	6285	170	10	134	8960	227
10	—	1	3	—	—	4	0 584	32	130	3233	141	10	134	694	163
11	—	1	3	—	—	5	0 516	32	121	2585	132	10	134	708	20
12	—	1	3	—	—	6	0 579	31	122	3455	138	10	134	835	214
13	Cement, Globe brand	1	2	—	—	4	0 855	38	125	4555	134	10	132	6675	177
14	Sand, Nepean	1	2	—	—	5	0 723	38	122	4582	133	10	131	5532	148
15	Stone, sandstone, 2 in. gauge and downwards	1	2	—	—	6	0 698	37	131	5320	142	10	127	567	131
16	—	1	3	—	—	4	0 560	37	128	3248	88	10	127	5022	150
17	—	1	3	—	—	5	0 500	37	126	4532	111	10	131	6317	168
18	—	1	3	—	—	6	0 5145	36	126	3300	92	10	131	6272	167
19	Cement, Red Cross brand	1	2	—	—	4	0 782	37	136	5387	115	10	131	5387	115
20	Sand, Nepean	1	2	—	—	5	0 741	38	148	6686	179	10	131	5387	115
21	Stone, pebbles, 2 1/2 in. gauge and downwards	1	2	—	—	6	0 537	38	149	7075	204	10	131	5387	115
22	—	1	3	—	—	4	0 514	37	159	7078	189	10	131	5387	115
23	—	1	3	—	—	5	0 574	39	148	5333	149	10	131	5387	115
24	—	1	3	—	—	6	0 549	35	135	4025	125	10	131	5387	115
25	Cement, Red Cross Brand	1	2	1	—	4	0 856	33	132	5953	248	10	140	12566	372
26	Sand, Nepean. Stone, bluestone	1	2	1	—	5	0 732	33	133	7263	248	10	140	12566	372
27	1 1/2 in. gauge and downwards	1	2	1	—	6	0 583	33	127	7448	198	10	140	10328	275
28	Cement, Globe brand	1	2	—	—	4	0 866	44	132	7417	173	10	140	8903	238
29	Sand, Nepean. Stone, bluestone	1	2	—	—	5	0 744	43	138	7876	154	10	142	7504	201
30	1 1/2 in. gauge and downwards	1	2	3	—	4	0 731	43	118	2634	80	10	142	6317	159
31	Cement, Globe brand	1	2	—	—	4	—	38	121	7649	253	10	149	5690	130
32	Sand, Nepean	1	2	—	—	5	—	38	120	6380	176	10	149	5555	148
33	—	1	4	—	—	6	—	36	120	4434	119	10	117	3219	149

SERIES VI.—CORK CONCRETE.

No.	Description.	Proportions used in gauging.			Weight per cubic ft. in lb.	Breaking weight in lb.	Modulus of rupture.
		Cement.	Small coke.	Large coke.			
1	12 in. by 12 in. by 48 in.	1	4	—	60	7772	204
2	ditto	1	4	—	67	7884	166
3	ditto	1	4	—	67	7362	158
4	ditto	1	3	—	67	7168	188
5	ditto	1	3	—	69	7896	265
6	ditto	1	3	—	68	7840	206
7	9 in. by 9 in. by 45 in.	1	4	—	73	4183	217
8	ditto	1	4	—	72	3481	217
9	ditto	1	4	—	75	4458	279

SERIES VII.—TENSILE TESTS OF CONCRETE BRIQUETTES.—MEAN OF THREE TESTS.

No.	Description.	Proportions used in gauging.					Age in days.	Breaking load in lb. per sq. in.	Age in days.	Breaking load in lb. per sq. in.	
		Cement.	Sand.	Screenings.	Stone.	Water.					
1	Cement, Globe brand	1	2	—	—	4	0 747	66	116 9	94	102 3
2	Sand, Nepean	1	2	—	—	5	0 559	65	36 6	120	102 5
3	Stone, bluestone, 1 1/2 in. gauge.	1	2	—	—	6	0 763	64	42 2	190	70 2
4	—	1	3	—	—	4	0 560	63	25 3	190	70 1
5	—	1	3	—	—	5	0 525	64	34 7	190	41 3
6	—	1	3	—	—	6	0 543	64	35 9	190	63 8
7	Cement, Globe brand.	1	2	—	—	4	0 883	64	38 6	183	21 3
8	Sand, Nepean	1	2	—	—	5	0 769	63	72 4	183	94 5
9	Stone, sandstone 2 1/2 in. gauge and downwards.	1	2	—	—	6	0 716	63	50 8	183	92 5
10	—	1	3	—	—	4	0 588	62	44 2	174	41 4
11	—	1	3	—	—	5	0 527	61	39 7	185	69 9
12	—	1	3	—	—	6	0 510	61	36 3	183	54 4
13	Cement, Globe brand.	1	2	—	—	4	0 981	59	61 0	183	113 2
14	Sand, Nepean	1	2	—	—	5	0 757	58	75 4	182	105 5
15	Stone, sandstone 2 in. gauge and downwards.	1	2	—	—	6	0 710	58	67 7	182	86 0
16	—	1	3	—	—	4	0 589	61	50 9	182	88 9
17	—	1	3	—	—	5	0 547	61	72 9	182	114 2
18	—	1	3	—	—	6	0 536	63	67 5	182	81 2
19	Cement, Tripod brand.	1	2	—	—	4	0 993	41	54 3	181	12 5
20	Sand, Nepean	1	2	—	—	5	0 852	40	63 5	181	35
21	Stone, bluestone, 2 1/2 in. gauge and downwards.	1	2	—	—	6	0 710	38	41 3	181	74 8
22	—	1	3	—	—	4	0 572	36	44 5	181	57 2
23	—	1	3	—	—	5	0 575	36	27 5	181	61 7
24	—	1	3	—	—	6	0 543	34	36 6	181	71 3
25	Cement, Tripod brand.	1	2	1	—	4	1 144	70	109 1	182	1180
26	Sand, Nepean	1	2	1	—	5	1 253	38	75 6	182	121 9
27	Stone, bluestone 1 1/2 in. gauge and downwards	1	2	1	—	6	1 160	35	90 7	182	11 59
28	—	1	3	1	—	4	1 109	35	87 8	181	106 8
29	—	1	3	1	—	5	1 136	33	109 6	181	125 2
30	—	1	2	3	4	1 068	28	74 8	181	110 2	
31	Cement, Tripod brand.	1	2	—	—	4	0 983	37	116 4	181	159 4
32	Sand, Nepean	1	2	—	—	5	0 754	39	90 1	181	158 2
33	—	1	3	—	—	6	0 571	63	72 0	181	52 1

rough walling. Metamorphism generally does not tend to the formation of an easy-working stone. Still it is a valuable process, for it has produced what is known as slaty cleavage, without which we would have no Welsh or other true slates. By far the greatest surface area here is covered with these altered old sedimentary rocks.

Hence there are no quarries of any kind located in the county. R. Hunt reported that in 1858 the Old Red quarries at Longstop were nearly exhausted. There is a granite quarry at Kinstry, parish of Aldham, which gives occasional employment to one man. It is worked by Mr. D. Davidson.

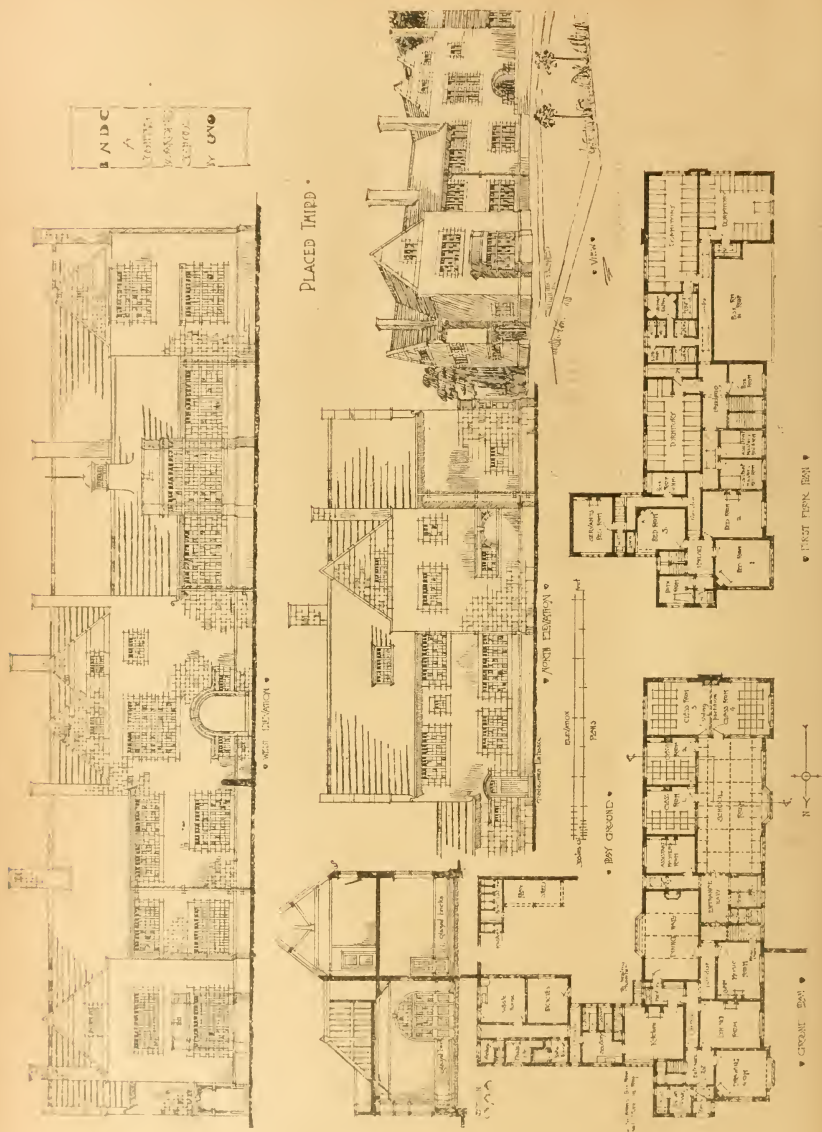
ORKNEY AND SHETLAND.

The rocks here are Old Red Sandstone. Upper on Orkney and Lower in Shetland. Dalriadan Gneiss and mica schist. Cambrian rocks alter to blue slates and schists, with beds of crystalline limestone, coarse gneiss, and quartzite. Granite, 201. Scoriae, Basalt in dykes, lavas, tuffs, Kirkwall and Lerwick are built on Old Red Sandstone. The Orkney Islands are mainly Old Red Sandstone, the Upper being found in Hoy, and the Lower at Pomona or Mainland. On the west of Shetland the cliffs around St. Magnus Bay are mostly Lower Old Red Sandstone. It is also found on the coast by Lerwick and south of Boddam; but this island and the adjoining ones of Vell, Fetlar, and Unst, are mostly occupied by crystalline metamorphic gneisses, schists, quartzites, and limestones. There are contemporaneous interbedded lavas and tuffs in the sedimentary rocks, which all point to long-continued and violent volcanic action during their deposition. The Old Red quarries in Orkney are Ferness, Island of Eday, Messrs. J. Hood and Sons' seven men, and Yesnaby, Sandwick three men, which is worked only occasionally. There is a freestone quarry at Southwick, which is worked and worked by Mr. H. Sinclair with six men. This is the Old Red and the stone is extensively used in Lerwick.

PERTSHIRE.

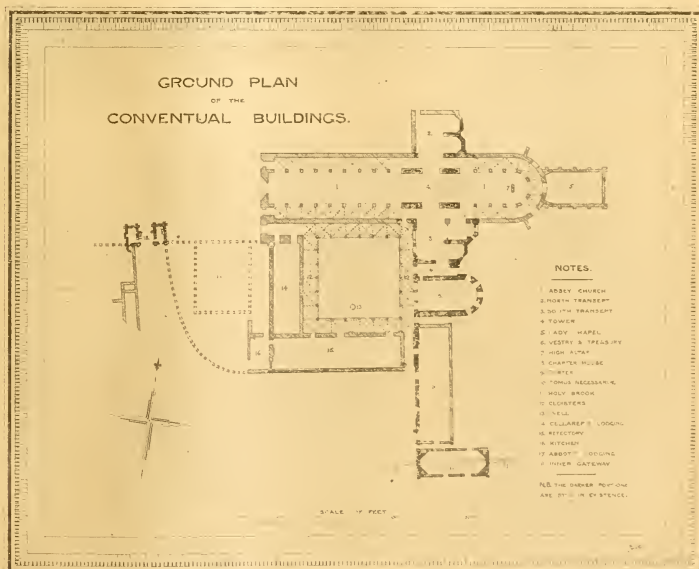
The rocks in this county are all the subdivisions of the Scotch Cambrian series, Old Red Sandstone, 201, 202, Dalriadan Schistose rocks with limestones, Quartzite, Greywacke, and Basalt interbedded and intrusive. Porphyrite, Felsstone, and other igneous and altered rocks. Auchtermuchty and Gifford are built on Old Red Sandstone. Blairgowrie, Old Red Sandstone. Raised Beach, Alluvium, Dunkeld Metamorphic Grit and Schists, Alluvium, Perth, Alluvium, Old Red Sandstone, Porphyrite, and Basalt. Unfortunately for the builder, a large area of this country is occupied by Dalriadan Crystalline rocks, which are pierced by masses of granite, quartz felsite, and diorite, the latter forming sheets and dykes. The east of the county is Old Red Sandstone, which is interbedded with sheets of igneous rocks, the result of contemporaneous lava flows; there are also beds of tuff and other volcanic ejections. The Carboniferous rocks are found in the detached portion of this county lying between Clackmannanshire and the river Forth, some of the quantities in which are already described under "Fifehire."

Old Red Sandstone is the building stone of Perthshire. A line drawn north-east and south-west across the meridians, at an angle of about 45°, through Gifford, marks the west boundary of this formation. This line passes from Altyon on the north-east, through Blairgowrie, Dunkeld, Gifford, Callander, and Aberfeldy to Loch Lomond on the south-west, all the country to the west of it being Lower Old Red Sandstone, except the summit of the Ochil Hills, which is Porphyrite, or Old Red metamorphosed. The chief quarries in the Lower Old Red rocks are deposited are Kinross, Invergowrie, Messrs. J. Morrison and Son, 45 men, Benhath, Blackford, The Benhath Quarry Co., 14 men, Lamberkin, Aberfeldy, Messrs. J. and W. Beveridge, 13 men; Culterick, Gifford, Mr. P. Haylay, 13 men; Keithick, Gifford, Mr. J. Bruce, 10 men; Loch, 10 men; Messrs. Fraser and Morton, 9 men; Blairgowrie, Blairgowrie, Mr. A. Hill, 4 men; Laggan, Gifford, Mr. D. Buchan, 4 men; Tullibardie, Auchtermuchty, Mr. P. Anderson, 3 men; Lucas, Muthill, Mr. R. McDougal, 3 men; Newlands, Muthill, Mr. W. Thomson, 3 men; South of Dundee, Mr. Stoddart, Newhouse, Perth, Messrs. H. Hamilton and Sons, Kinross, Laggan, Mr. S. Paul and Sons, and Auchtermuchty, Mr. A. Ritchie. Some of the old "Red" quarries once extensively worked, but now closed, are: Blairgowrie, which furnished stone for the Glasgow Waterworks and many bridges and warehouses; Black Cap, Angus, and Kippa Muir, both of which furnished much stone for wallings, dressings, lintels, steps, thresholds, &c.; Muthill-by-Aberfeldy, furnished stone for a bridge across the Tay near Muthill; Altyon, Muthill, near Edinburgh, and "Blackly" furnished sandstone for the erection of municipal and private buildings. Blairgowrie was still worked occasionally. The Kinross Quarry, as well as seen, after employment at present is 31 men, and it may therefore be described as the largest Freestone quarry at present worked in the country. It turns out cube stones not exceeding





THE INNER GATEWAY.



READING ABBEY.

OBITUARY.

Two months ago, in his 73rd year, Mr. Edward Irving R.A., the distinguished sculptor, whose name on Monday at his residence in 15, Whitehall, was the subject of a eulogistic notice in this paper, was born in London in 1828, and was at the age of 18 to Antwerp as a student of painting, and afterwards entered the studio of Peter Wappers, of Munich. Under the stimulus of this master, Oudow Ford devoted himself to sculpture. In early manhood he had already attracted the attention of the Royal Academy, and in 1850, in conjunction with the statue of Sir Rowland Hill which stands in the Royal Exchange, and in 1852, in a work of many well-paid commissions to execute. His first piece of sculpture exhibited at the Royal Academy was a portrait bust of the young wife he had married in Munich when he was only 21—a daughter of Baron Franz von Krasser, and each year since he has shown several works of late years averaging half a dozen, and often one or two of these have been of such colossal dimensions as to be built up in the open courtyard of Burlington House. The seated statue of Sir Henry Irving as Hamlet, executed in 1883, and now in the Guildhall Art Gallery, attracted the attention of the Academy. In the same year Mr. Ford also produced his standing statue of Mr. Gladstone for the City Liberal Club. Professor Huxley, Dr. Dale, and the Duke of Norfolk were examples of the sculptor's seated figures. The immense statue of Queen Victoria which Mr. Ford executed for the city of Manchester, and which was seen at the Royal Academy exhibition of this year, and was unveiled in Manchester by Earl Roberts on the 11th October last, represented her Majesty upon the throne. Other works of his are the Shelley Memorial, which has found a resting-place in University College, Oxford; the Jowett Memorial in the same city, the equestrian statue of Lord Strathairn in Kensington, and a number of equestrian statues, that of the late Maharajah of Mysore shown in the quadrangle of Burlington House last year; the Marlowe Memorial at Canterbury, and the statue of Gordon upon a camel, which stands at Chatham. The Gordon Memorial Shield, which the Corps of Royal Engineers presented to the General's sister, and which she and the artist displayed in the light. At Burlington House this year he exhibited a nude bronze statuette in honour of those who have fallen in South Africa, and called it "Glory to the Dead," while his bust of celebrities were numerous, and were in nearly every case characteristic portraits. His "Folly" is now in the Victoria and Albert Museum, and was by Mr. Ford, who was elected R.A. in 1888 and R.A. in 1895, leaves a widow and a family.

His death occurred in Edinburgh, on Friday, Mr. John H. Macdonald, R.S.A., at the age of seventy-three. The deceased studied in Edinburgh, and in 1852 gained the first prize for painting from life and was elected an Associate of the Royal Scottish Academy. His picture, "Prince Charlie leaving Scotland, or the Last of the Stuart Race," was exhibited at the Edinburgh Exhibition of 1862. Another well-known painting of his is "The Men of Glenlivet," which is now in the National Gallery of Scotland. He also produced numerous paintings of subjects from Sir Walter Scott's works, all of which were engraved for the Royal Association for the Promotion of Fine Arts. He travelled extensively in the Continent, and in 1876 turned his attention to landscape painting.

Mr. EDWARD WILLIAM SMITH, M.R.A.S., hon. A.R.C.S., a geological surveyor of the North-Western Province, died on Monday at his private home of cholera, at the early age of 12 years, who lately referred in our last issue, entered the Indian Survey Department as assistant architectural surveyor in 1880, and in that capacity made a detailed examination of the Mound and ruins of Fatchpur-Sikri, the ruined city of Akbar, the remains of which were described in our last issue, illustrated with photographic plates, and issued under the orders of Government. A handbook based on this understanding, the first of which had been drawn up, was one of the unfinished projects Mr. Smith had intended at the time of his death. Another of his projects would have been the China-Ka-Rauz, a building for which he had made a great and beautiful design for the exterior and interior, and two worked out, innumerable designs. Mr. Smith married Dr. Parke as the provincial head of his department and curator of Lucknow

Museum in 1898. Under the directions of Sir Antony McDermott, Mr. Smith accomplished a great deal during his brief tenure of the appointment in the restoration and conservation of ancient buildings. The famous Taj Mahal at Agra was restored under Mr. Smith's supervision by native artificers engaged, claiming to be descended from those who were employed by Akbar and Shah-jahan. The splendid surroundings of the approach to the Taj have been restored, the conversion of the barren ravines and huts lying between that "dream in marble" and the Fort into a public park. Restoration on an extensive scale has been conducted by Mr. Smith at Fatchpur-Sikri, and the more important ancient buildings of Alahabad, Lucknow, Fyzabad, and Bahraich were also repaired. A portfolio of architectural drawings, intended to influence good Indian design and workmanship by a return to ancient models, was in course of preparation by Mr. Smith.

CHIPS.

At Friday's meeting of the library, museum, and arts committee of the Liverpool Corporation, it was resolved to expend £1,247 lbs. on a series of cabinets for the storage of the material in the "Study collections." The committee accepted the gift from Alderman Oakshott of the pictures "Temple of Jupiter" and "The Acropolis of Athens," and Sir Alfred Jones's gift of the picture, "The 21st Lancers at Omdurman."

At Bexhill, on Saturday, Lord Brassey opened a new drill hall, which he had and was presented to the local battery of the 2nd Cinque Ports Artillery Volunteers, of which he is the honorary colonel.

The properties offered last week were not numerous, but the heavy total of £293,762 was amply made up. Tokenhouse-yard Mart. The principal feature was the sale, for £169,000, of four important Scotch estates, consisting of 5,130 acres, in the county of Fife.

At a special meeting of the Belfast Corporation the principle of the Ombuds Bill, of which notice has been given, has been approved. Deputations representing respectively the architectural profession and the gasfitting and electrical engineering trades waited upon the council to urge objections to some of the provisions of the bill, and they were taken into their interests. It was arranged that a special meeting should be held to discuss the clauses of the Bill.

An arbitration was held at the Leeds Town Hall on Saturday for the purpose of assessing the amount of purchase-money and compensation to be paid by the Leeds Corporation to the Leeds and Bradford Electric Light and Power Company in respect to the compulsory acquisition from her of some ten acres of land at Fawcett, in the Washburn Valley required for the purpose of the extension of the Leeds waterworks.

A scheme of extension and improvement of the Fawcett Waterworks, which is being carried out. A division wall which separated the church and hall has been removed, and the entire area taken in. A transept has been formed on the south side of the edifice, the pulpit reconstructed, the buildings have been renovated, and a new pipe organ has been erected in the transept by Messrs. Abbott and Smith, Leeds.

Major Druid, R.E., made an inspection on behalf of the Board of Trade on Friday of the new electric tramway constructed by the Wigan Corporation to Wigan, which has been laid on the Apsall boundary, but for the present it is intended to run only to Whalley. The cost of construction and equipment of the line will be about £20,000.

The Cottage Homes for the pauper children of the Stoke-on-Trent Union, which have been erected at Penkhall, Stoke, were formally opened by the Right Hon. Henry Chaplin, M.P., late President of the Local Government Board, on Thursday last week. The homes, which are 12 in number, accommodate 140 children, and, in addition, the buildings consist of a superintendent's house and master rooms, the homes being entirely lighted by electricity. The plans were designed by Mr. C. Lynam, the contractor was Mr. T. R. Yoxall, the grounds were laid out by Mr. W. Lowe, of Stoke, and the electric plant installed by Mr. G. I. Peers, Manchester.

Hardwood spike plugs are being tried on several railways in France, to increase the holding power of ordinary and screw spikes when driven in Baltic pine and other soft woods. Holes about 1 1/2 in. diameter are bored in the tie, and tapped to receive screws of hardwood 1 3/16 in. diameter at the head, and 1/2 in. at the top, each with a round head to prevent splitting. The wooden screws are hollow, and the iron spikes or screw spikes are driven into them. The increase in holding power is from 30 to 50 per cent. for new pine ties, while in old ties it is from 25 to 50 per cent. in oak, and 80 per cent. for pine.

COMPETITIONS.

WAT HAMSTON.—The competitive designs submitted for the Baptist church and schools, Blackhorse-road, by Messrs. George Baines, R.A., and J. Palmer Baines, 5, Clement's Lane, Strand, W.C., have been judged. The accommodation provided in church is 812 adults. The estimated cost, including tower, is £1,471.

At the next meeting of the Sanitary Inspectors' Association, to be held at Carpenters' Hall, London Wall, on Saturday in next week, January 1, the chair will be taken by the new president, Sir James Crichton Browne, F.R.S., who will deliver his inaugural address.

At the Church of St. Nicholas Cole Abbey, a memorial tablet to the late Professor Shuttleworth was unveiled and dedicated on Sunday evening. The tablet, which has been affixed to the wall on the right of the altar, is of bronze, and is Renaissance in type, to suit the character of the church.

A new restaurant in Foregate-street, Chester, was opened last week. It has on the first floor a ball-room, accommodating 200 dancers, and is lighted throughout by electricity. The structural alterations have been carried out under the superintendence of Messrs. Douglas and Fordham, architects, the building contract being entrusted to Messrs. Vernon and Son, also of Chester.

Three assistant engineers are required for the supervision of the construction of railway extensions in the Federated Malay States. The salary offered is £300 per annum paid at sterling rates, with field and other allowances and free unfurnished quarters. The engagement is for three years. The sterling value of salary marks a new departure in engagements.

The application of the Ventnor Urban District Council for permission to borrow £175 for the purchase of the East Cliff land formed the subject of a Local Government Board inquiry on Thursday last week, conducted by Mr. H. F. Boulton, M.C.

The Tyneside Tramways and Tramroads Company, who are at present engaged in constructing lines between Gosford, Wallsend, and North Shields, are applying this session for further routes, which, on account of the extent and nature of the districts served, must be of great importance towards the rapid development of the district to the north of Newcastle. The Company are also making application to Wallsend to serve the workmen employed at the riverside yards. The aggregate length of the proposed new routes is about 11 miles, and the lines are laid out so as to communicate with or cross any of the existing system of the Newcastle Corporation and the Tynemouth and Whitley Tramways.

At the Audit House, Southampton, on Wednesday week, Mr. H. Percy Boulton, one of the inspectors of the Local Government Board, held an inquiry concerning the corporation's application to borrow £908 for purposes of sewerage, £362 for works of paving in Canute-road, and £387 for electric lighting purposes.

In the bankruptcy business of the Manx High Court at Douglas on Friday, before Deemster Knapp, application was made on behalf of Quiggin and Co., creditors for the adjudication of Frederick Culloh, local builder, as bankrupt. The debtor had recently executed a deed of assignment in favour of creditors, and Mr. Coole, who appeared to oppose the same, was nothing more to be gained by bankruptcy. His Honour made an order of adjudication.

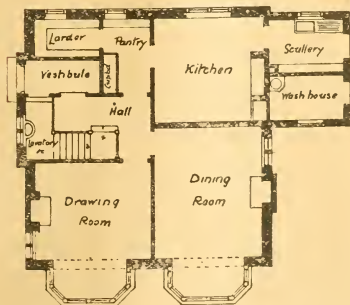
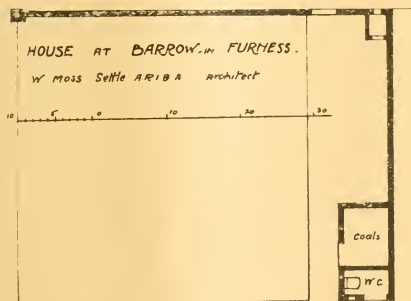
Messrs. William Pearce, of Bridge-street, Birmingham, have just completed for shipment a window, to be erected in the great hall of the Engineers' Institute, Penang, Straits Settlement, to commemorate the services and benevolence of Capt. Cheung Keng Kwi. The window consists of three lights, each 10 ft. high by 4 ft. wide. In the centre light is a life-size figure, representing Cheung Keng Kwi in full mandarin attire of the highest grade. The figure is in a caryatid position, and is a masterpiece of design. In the right-hand light "Science" is depicted as a female figure, holding a pair of compasses on a terrestrial globe. She is arrayed in a dull blue gown, embroidered with gold, and has a mantle of deep ruby. The right-hand light has a figure of a blacksmith, with anvil, representing "Engineering."

Mr. Alfred Younghausbain, executive engineer of the Public Works Department in the Punjab, died on Friday last, aged 10 years. He was a son of General R. B. Younghausbain, C.B., of Clifton, Bristol.

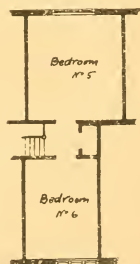
The Wolverhampton Corporation having applied to the Local Government Board for permission to borrow £1,232 for the provision of houses for the working classes, Major C. E. Norton, R.E., attended at the Wolverhampton Town hall on Friday to hold an enquiry into this matter.



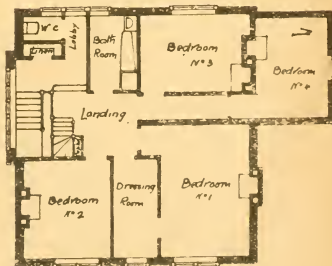
W MOSS SETTLE ARIBA ARCHTCT 1900



GROUND PLAN.



SECOND FLOOR PLAN.



FIRST FLOOR PLAN.

Some instructive statistics relating to housing in Glasgow and Edinburgh are given in a recent report prepared for the Glasgow Corporation by Mr. James Henry, the city assessor:—Glasgow at the present time, with a population of 760,123, has 35,000 one-apartment houses at an average rental of 3s. 7d., 70,000 two-apartment houses at an average rental of 4s. 10d., and 26,500 three-apartment houses at an average rental of 15s. The remaining 24,000 houses, which go to make a total of 156,500 dwellings-houses in the city, are of four apartments and upwards. There are 3,000 empty houses. In Edinburgh, which has a population of 316,479, there are 17,621 houses over 6s. and under 11s. rental, and 13,055 houses over 11s. and under 16s. rental.

THE ROCK TOMBS of Sheikh-Said are described by Mr. N. de G. Davies in the Tenth Memoir just issued by the Archaeological Survey of Egypt. This necropolis, excavated in the cliffs on the eastern bank of the Nile, about 180 miles south of Cairo, contained the remains of one of the chief families of burial for persons of importance in the district. The tombs, which have already engaged the attention of explorers, are rock-cut chambers, sometimes single, sometimes connected, scattered irregularly along the line of crags, and are, unfortunately, often much cut off from the surface of the cliff by a thin stratum, not directly connected with the general history of the kingdom, their dates are not easily determined; but one of the most important can be linked with the fifth dynasty, and some in an inferior style may be as late as the seventh or eighth dynasties. Graffiti upon the walls of certain of them were used as Coptic dwellings, probably about the 4th century of the present era—one, indeed, much to its detriment, having been converted into a church. But the decorations are often interesting, particularly those in the rich tomb of Urmia, together with that of his father. They were placed, apparently in the fifth dynasty, were called the *heliopolis* or province, and these sepulchres give a vivid picture of the life and occupations of the ancient Egyptians more than five thousand years ago.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY.—Society of Arts, "Photography and its Application," No. 2, by Sir H. Truman Wood, Secretary, 5 p.m.

THURSDAY.—Civil and Mechanical Engineers' Society: "Engineering Observations in 1901 in the United States," by A. S. E. Ackermann, 5 p.m.

FRIDAY.—Architectural Association. "Development of Domestic Architecture," by J. Alfred Gorton, 8 p.m.

SATURDAY.—Sanitary Inspectors' Association. Inaugural Address, by Sir J. Orlin Brown, F.R.S., President. Carpenters' Hall, London Wall.

THE ARCHITECTURAL ASSOCIATION.

JANUARY 30th, ORDINARY GENERAL MEETING at 7 p.m., Westminster, W., at 7.30 p.m. Paper by Mr. J. ALFRED GORTON on "The Development of Domestic Architecture from the Twelfth to the Eighteenth Century." Illustrated by Lantern Views.

DAY SCHOOL.—THE SPRING TERM begins on MONDAY, JANUARY 14th, 1902. Intending students are requested to apply for particulars to the Secretary, 14, Great Marlborough Street, W., as soon as possible.

R. S. BALFOUR, Hon. Secy.

H. G. M. MALLIE, Hon. Secy.

The Neath Rural District Council proposes an expenditure of £16,000 for water supply.

At a special meeting of the town council of Devises on Friday, an important step was taken in the adoption of a proposal to sell to the committee some adjoining property, which belongs to the corporation, and which will enable the museum authorities to extend their premises by the addition of a library, dwelling-house for caretaker, &c.

The designs of Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, have been accepted for the Congregational church, Bury Park, Luton, Beds. The estimated cost is £2,500, inclusive of a tower. The seating accommodation is for 533 adults. The facings are of red brick, and the dressings of Bath stone.

Messrs. Waters and Worrall, of Cambridge, have been instructed to prepare a scheme of sewerage for Newnham Croft, in the Chertsmore Rural District.

The memory of the late vicar of Leverstock Green, Hert., the Rev. George Finch, is perpetuated by a new organ placed in the church, and the chancel has been entirely refitted with new oak choir seats and clergy desks. The latter work has been executed by the Lambeth Guild of Carpenters, of 44, Lower Kennington-lane, S.E., from designs by Mr. F. F. Glennie, of 16, Chiford's Inn, E.C.

LATEST PRICES.

IRON, &c.			STONE.*		
Rolled-Iron Joists, Belgian.....	Per ton.	62 0 0 to 63 0 0	Darby Dale, in blocks.....	per foot cube	2 14
Rolled-Iron Joists, English.....	Per ton.	61 0 0 to 62 0 0	Red Mansfield, ditto.....	per foot cube	2 14
Wrought-Iron Girder Plates.....	Per ton.	7 10 0 to 7 15 0	Hard Yarncliffe, ditto.....	per foot cube	2 10
Bar Iron, good Stocks.....	Per ton.	6 15 0 to 6 20 0	Ditto ditto, in, sawn both sides, landings, random sizes.....	per foot sup.	0 2 8
Do, Lowdown, Flat, Round, or square.....	Per ton.	20 0 0 to 20 0 0	Ditto ditto, in, slabs sawn two sides, random sizes.....	per foot cube	0 1 3
Do, Welsh.....	Per ton.	5 15 0 to 5 17 6	London-Wood Hard, in blocks, perfect cube.....	per foot cube	0 2 8
Boiler Plates, Iron—			Ditto ditto, in, ditto sawn both sides, random sizes.....	per foot cube	0 1 1
South Staffs.....	Per ton.	10 0 0 to 10 0 0	Portland, White Red, ditto.....	per foot cube	5 20
Best Sneathill.....	Per ton.	12 0 0 to 12 0 0	Ditto Base Red.....	per foot cube	0 2 11
Angles 10s., Tee 20s. per ton extra.			* All F.O.R. London.		
Builders' Hoop Iron, for bonding, &c., 65 lbs.			OILS.		
Builders' Hoop Iron, galvanised, 41s. 10s. 0d. per ton.			Lined.....	per ton	£30 15 0 to £31 0 0
Galvanised Corrugated Sheet Iron—			Rapeseed, English pale.....	per ton	27 0 0 to 27 10 0
No. 18 to 20.....	Per ton.	20 22 to 21	Do, brown.....	per ton	25 10 0 to 25 10 0
Off. to 8 ft. long, inclusive.....	Per ton.	21 0 0 to 21 0 0	Cottonseed, refined.....	per ton	22 0 0 to 22 0 0
Best gauge.....	Per ton.	11 15 0 to 12 12 6	Do, refined, Spanish.....	per ton	21 0 0 to 21 0 0
Cast-Iron Columns.....	Per ton.	£5 10 0 to £5 10 0	Said, pale.....	per ton	21 0 0 to 21 0 0
Cast-Iron Columns.....	Per ton.	5 10 0 to 5 10 0	Cocunut, Coch.....	per ton	36 15 0 to 37 0 0
Rolled-Iron Fencing Wire.....	Per ton.	6 10 0 to 6 10 0	Do, Ceylon.....	per ton	25 0 0 to 25 0 0
Rolled-Iron Fencing Wire.....	Per ton.	6 10 0 to 6 10 0	Palm, Lagos.....	per ton	25 0 0 to 25 0 0
Cast-Iron Sash Weights.....	Per ton.	4 10 0 to 4 15 0	Oleum.....	per gal.	17 5 0 to 17 5 0
Cast Clasp Nails, Sin. to 6 in.....	Per ton.	9 15 0 to 9 15 0	Lubricating U.S.	per gal.	0 7 0 to 0 8 0
Cast Floor Brads.....	Per ton.	9 10 0 to 9 10 0	Petroleum, refined.....	per barrel	0 6 0 to 0 6 0
Wire Nails (Points de Paris).....			Tar, Stockholm.....	per barrel	1 1 0 to 1 1 0
0 to 7.....	Per 100 lb.	11 12 13 14 15 B.W.G.	Do, Archangel.....	per barrel	0 12 0 to 0 12 0
8 to 9.....	Per 100 lb.	11 9 10 11 12 13 14 15 B.W.G.	Turpentine, American.....	per ton	37 0 0 to 37 5 0
10 to 11.....	Per 100 lb.	11 9 10 11 12 13 14 15 B.W.G.	CHIPS.		
Cast-Iron Socket Pipes—			The town council of Lancaster accepted, on Friday, tenders amounting to £11,721 for the laying of a tramway, erection of carshed, construction of an overhead system, &c., the section including the route to Southforth and the Park.		
3 in. diameter.....	Per 100 ft.	£5 15 0 to £5 0 0	"Exact Measurement of Length" was the title of a lecture recently given by Mr. A. H. Allen before the members of the Yorkshire Engineering Society. He pointed out that the most minute measurement to which engineers attained—the one-millionth part of an inch—was not sufficiently accurate for the physicist, and he demonstrated how measurements of thousands of millionths parts of an inch are obtained by optical instruments. Amongst other results recorded is the measuring of the film of a soap bubble just previous to bursting. A vesicle has just been exhibited in Kinkell Church, Shropshire, as a memorial to Major Charles Baldwin Childie, late Royal Horse Guards, who was killed whilst leading his squadron in the attack on Bastion Hill, South Africa. The central figure represents the Good Shepherd, and the whole is carved in alabaster in harmony with the other tombs and monuments of this old country family.		
4 in. diameter.....	Per 100 ft.	5 12 6 to 5 17 6	The Baltimore and Ohio Railroad Company is building four miles of line in Pennsylvania, which is believed to be the longest continuous line in the United States. This little road will extend from Boswell, Pa., to Friedens on the Somerset and Cambria branch of the Baltimore and Ohio. The actual distance is about five miles, but the peculiar conformation of the country makes it necessary to loop a number of hills in order to get an easy grade. The new road doubles on itself four times, and at one point runs back to within a loop of about five miles, and round comes to making a loop of 300ft. of itself on a grade 50ft. lower.		
5 in. diameter.....	Per 100 ft.	5 12 6 to 5 17 6	A great sanitary and public improvement in the ancient water-courses at Winchester, known as The Brooks, long discussed and desired, is being carried out under the supervision of the city surveyor, Mr. Anderson. The cost will be £3,450, and a great portion of the work on the north of the High-street, in the Upper, Middle, and Lower Brooks, is well advanced, and the scheme affords confirmation of the old story of the antiquity of the water-courses, which boast an antiquity of upwards of 900 years, being the work of Bishop Athelwold. They have become a nuisance where still open, and are, in fact, a danger to heavy traffic, because of the rotten covering and weak brickwork of Georgian and later days. The water will now run through large glazed pipes to their junction with the already piped portions in the Close and College precincts. A Local Government Board inquiry as to the loan for the works has been held at the Guildhall before Mr. H. Percy Boulnois, M.I.C.E., inspector.		
6 in. diameter.....	Per 100 ft.	5 12 6 to 5 17 6	W. H. LASCELLES and Co.,		
7 in. to 24 in. (all sizes).....	Per 100 ft.	5 12 6 to 5 17 6	121, Bunhill Row, London, E.C.		
Best with composition, 5s. 0d. per ton extra; turned and bored pipes, 5s. 0d. per ton extra.)			TELEPHONE No. 270.		
Fig Iron—			HIGH-CLASS JOINERY.		
Cold Blast, Lilleshall.....	Per ton.	105s. to 112s. 6d.	LASCELLES' CONCRETE.		
Hot Blast, ditto.....	Per ton.	65s. 0d. to 70s. 0d.	Conservatories & Greenhouses.		
Wrought-Iron Tubes and Fittings—Discount of Standard Lists 3d. :—			WOODEN BUILDINGS.		
Gas-Tubes.....	Per 100 ft.	70s. p.c.	BANK, OFFICE, & SHOP FITTINGS.		
Water-Tubes.....	Per 100 ft.	70s. p.c.	CHURCH BENCHES & PULPITS.		
Steam-Tubes.....	Per 100 ft.	60s. p.c.	ESTIMATES GIVEN ON APPLICATION.		
Galvanised Gas-Tubes.....	Per 100 ft.	57s. p.c.			
Copper Sheet, Water-Tubes.....	Per 100 ft.	75s. p.c.			
Galvanised Steam-Tubes.....	Per 100 ft.	47s. p.c.			
10wt. coils, 5wt. coils.					
Zinc, English (London mill).....	Per ton.	£22 15 0 to £23 0 0			
Do, Vieille Montagne.....	Per ton.	25 0 0 to 25 10 0			
Sheet Lead, 36 lb. per sq. ft. super.....	Per 100 lb.	17 0 0 to 17 10 0			
Water Pipe, F.O.R. London.....	Per 100 lb.	13 6 0 to 13 17 6			
Pig Lead, in 100 lb. pigs.....	Per 100 lb.	11 0 0 to 11 0 0			
Lead Shot, in 28 lb. bags.....	Per 100 lb.	12 0 0 to 12 0 0			
Copper Sheet, sheeting and rods.....	Per 100 lb.	75 0 0 to 75 0 0			
Copper, British Cast and Ingot.....	Per 100 lb.	64 0 0 to 65 0 0			
Sin. Strips.....	Per 100 lb.	115 0 0 to 115 0 0			
Do, English Ingots.....	Per 100 lb.	117 0 0 to 117 0 0			
Spelter, Silesia.....	Per 100 lb.	16 12 6 to 16 15 0			
TIMBER.					
Teak, Burmah.....	per load	£10 0 0 to £17 5 0			
" Bangkok.....	per load	10 0 0 to 15 10 0			
Quebec Pine, yellow.....	per load	4 2 6 to 4 15 0			
" Oak.....	per load	4 6 0 to 6 15 0			
" Birch.....	per load	3 12 6 to 6 0 0			
" Elm.....	per load	5 0 0 to 6 0 0			
" Ash.....	per load	5 0 0 to 6 0 0			
Danitic and Memel Oak.....	per load	2 7 6 to 4 3 0			
" Fir.....	per load	2 0 0 to 3 10 0			
Wainscot, Riga p. log.....	per load	2 6 0 to 3 17 6			
Lath, Danitic, p. log.....	per load	4 0 0 to 6 0 0			
St. Petersburg.....	per load	4 0 0 to 6 0 0			
Greenheart.....	per load	7 15 0 to 8 0 0			
Box.....	per load	7 0 0 to 15 0 0			
Sesquino, U.S.A., per cubic foot.....	per cubic foot	0 1 9 to 0 2 0			
Mahogany, Cuba, per super foot.....	per super foot	0 0 6 to 0 0 8			
" Black.....	per super foot	0 0 6 to 0 0 7			
" Honduras.....	per super foot	0 0 6 to 0 0 7			
" Mexican.....	per super foot	0 0 31 to 0 0 51			
" Africa.....	per super foot	0 0 31 to 0 0 51			
Cedar, Cuba.....	per super foot	0 0 31 to 0 0 51			
" Honduras.....	per super foot	0 0 31 to 0 0 51			
Walnut, Italian.....	per super foot	0 0 31 to 0 0 51			
" American (logs).....	per super foot	0 0 31 to 0 0 51			
Do, per St. Petersburg Standard, 120—12ft. by 1 in. by 1 in.....	per super foot	0 0 31 to 0 0 51			
Galves, Pine, 1st.....	per 100 ft.	£22 0 0 to £23 10 0			
" 2nd.....	per 100 ft.	15 0 0 to 15 10 0			
Canada Spruce, 1st.....	per 100 ft.	12 0 0 to 14 10 0			
" 2nd and 3rd.....	per 100 ft.	9 0 0 to 10 10 0			
New Brunswick.....	per 100 ft.	9 0 0 to 10 10 0			
Riga.....	per 100 ft.	8 10 0 to 9 10 0			
St. Petersburg.....	per 100 ft.	8 10 0 to 9 10 0			
Sweden.....	per 100 ft.	8 10 0 to 9 10 0			
Finland.....	per 100 ft.	9 10 0 to 11 10 0			
White Pine.....	per 100 ft.	11 10 0 to 21 10 0			
Yellow Pine, all sorts.....	per 100 ft.	6 5 0 to 11 5 0			
Flooring Boards, per square of 1 in.—					
1st prepared.....	per 100 ft.	£12 0 0 to £18 6 0			
2nd ditto.....	per 100 ft.	0 11 0 to 0 11 6			
Other qualities.....	per 100 ft.	0 0 0 to 0 12 6			
Staves, per standard M.—					
U.S. pine.....	per 100 ft.	£37 10 0 to £45 0 0			
" Spruce.....	per 100 ft.	23 0 0 to 23 0 0			
Memel, black.....	per 100 ft.	15 0 0 to 20 0 0			





BIRD'S EYE VIEW

WIND.

WIND.



FIRST FLOOR.

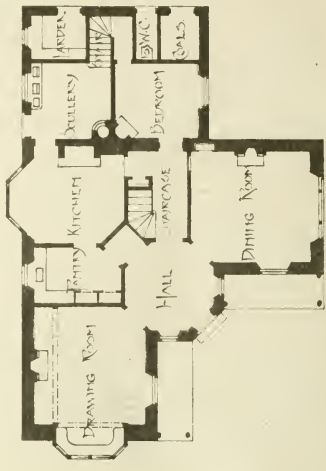
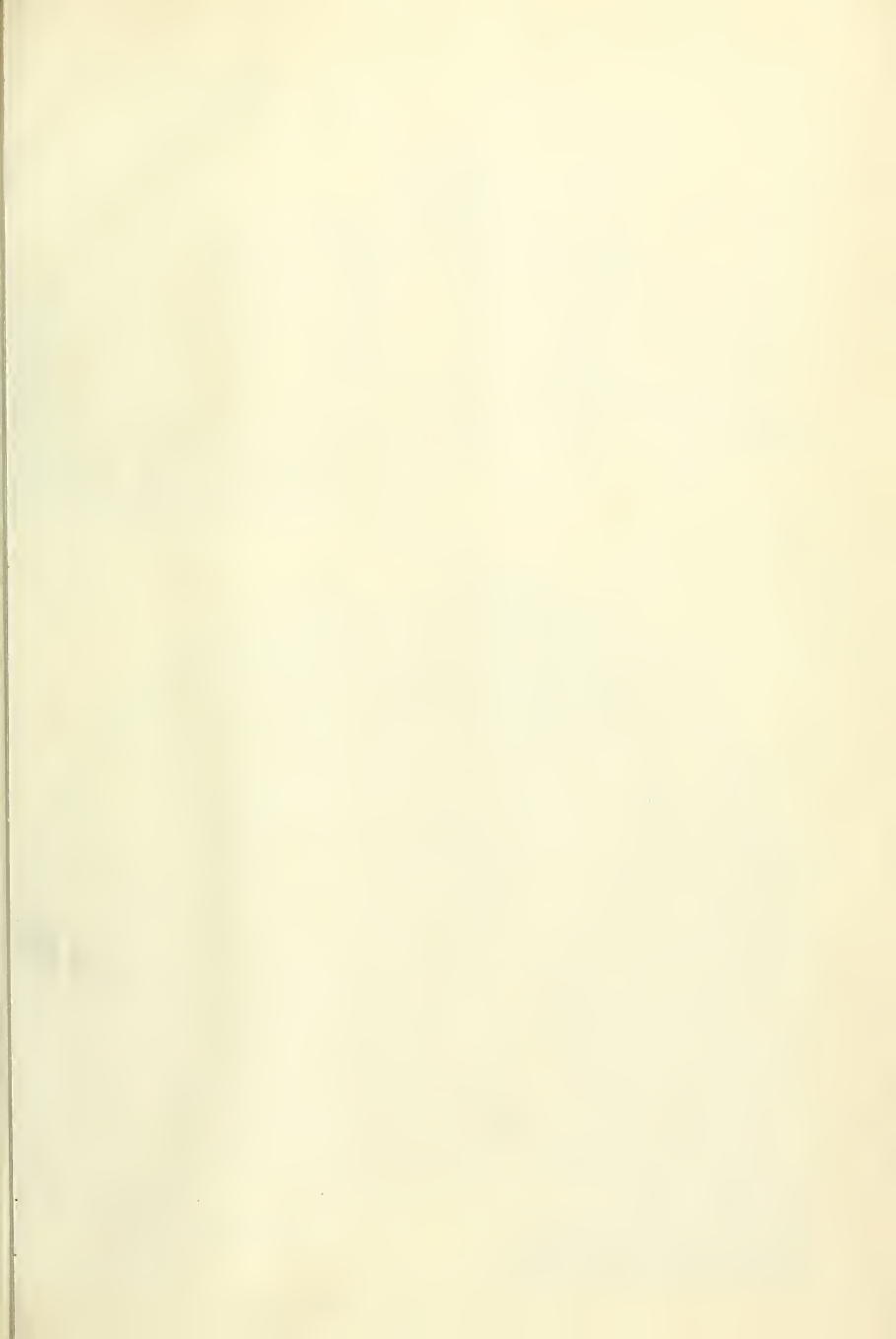




Photo T. C. 1111

• HOUSE AT ABOYNE - RIVER DEE - JAMES A. PIRIE - ARCA •

FRANK DEHN DEL. 1901



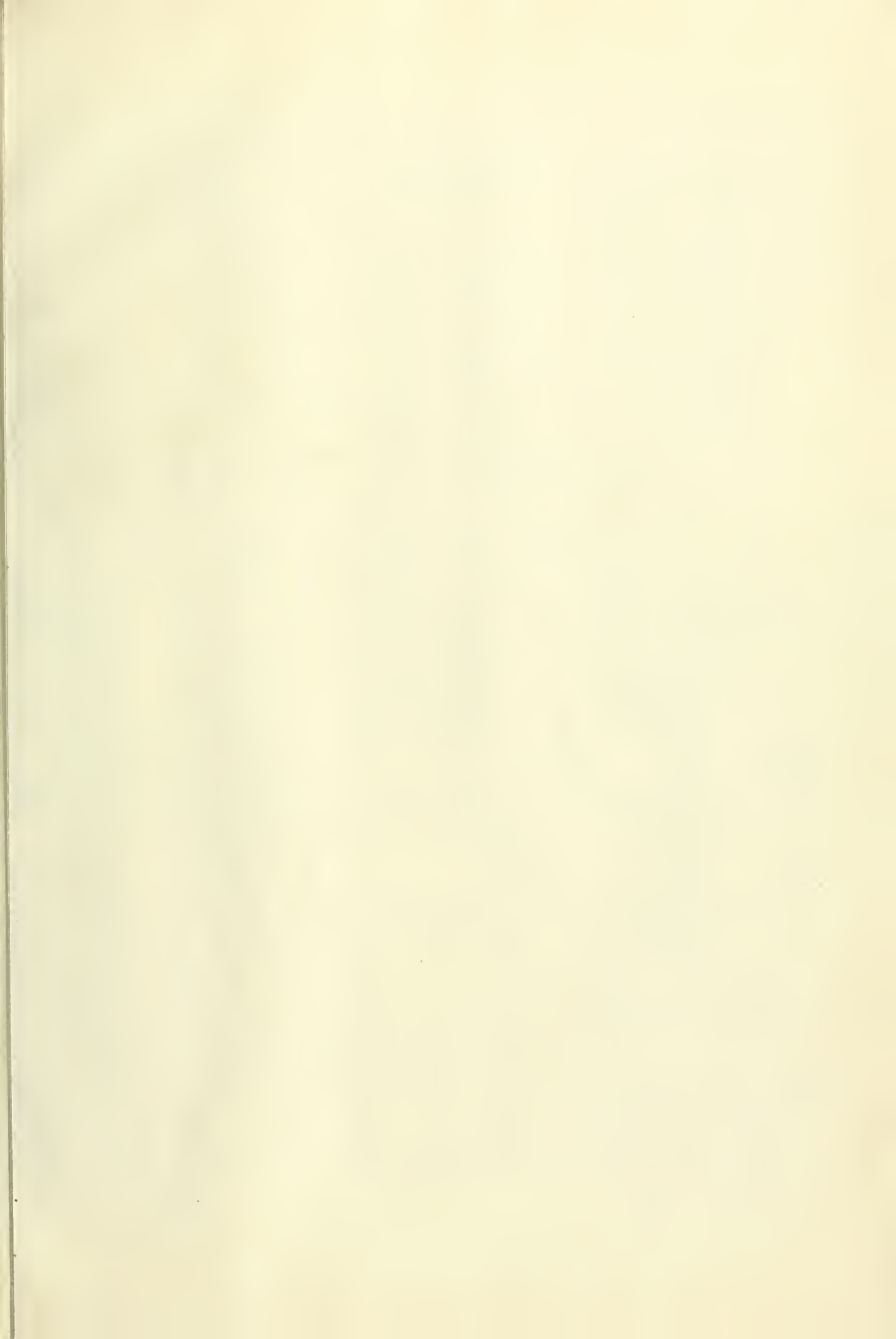


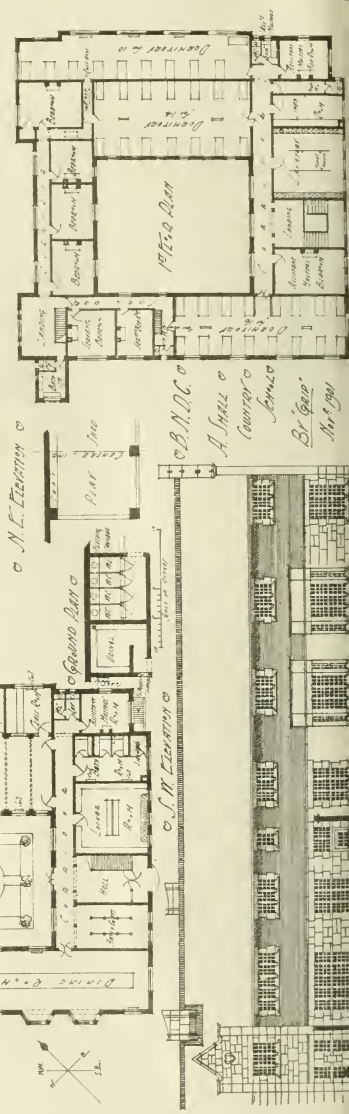
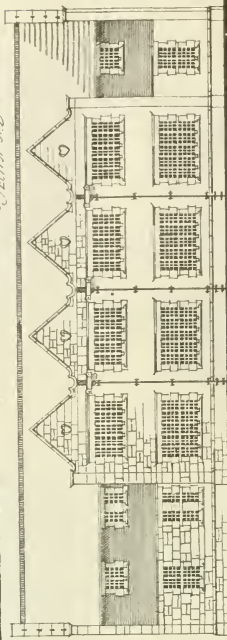
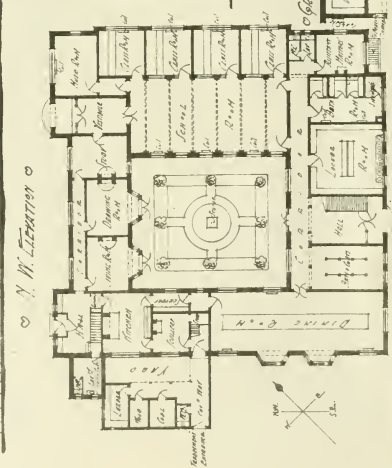
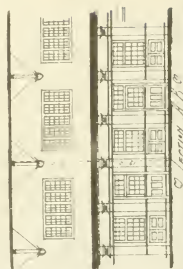
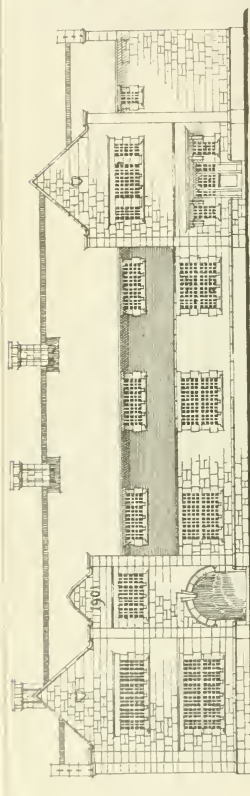
HOUSE AT WESTGATE-ON-SEA

THE HAMPSHIRE SYNAGOGUE

DELISSA JOSEPH ARCAT

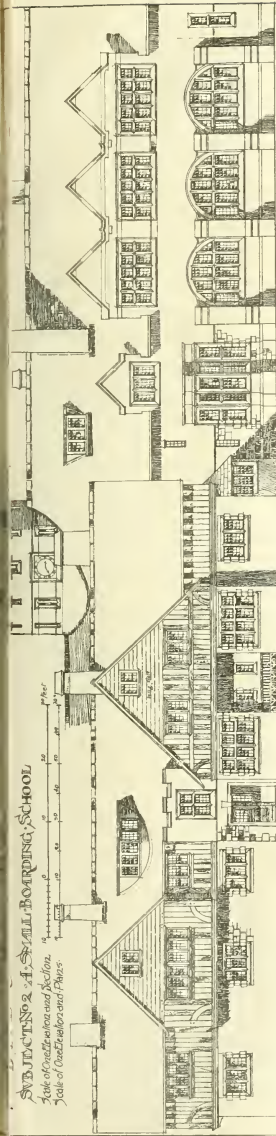




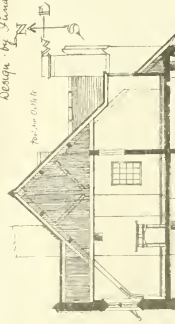


SECTION 2 - 4 SMALL BOARDING SCHOOL

Scale of construction and section
Scale of construction and plans

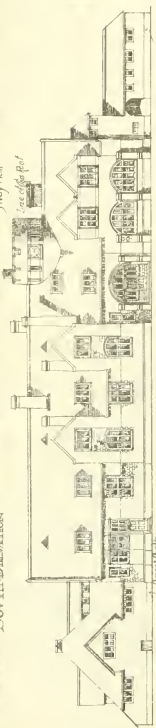


Water House
Design by Rousseau



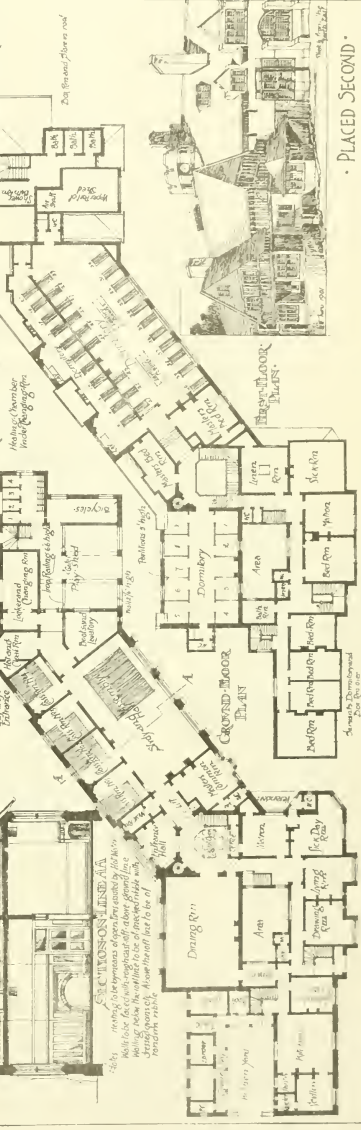
SECTION 2-4

Study hall
Rec. hall



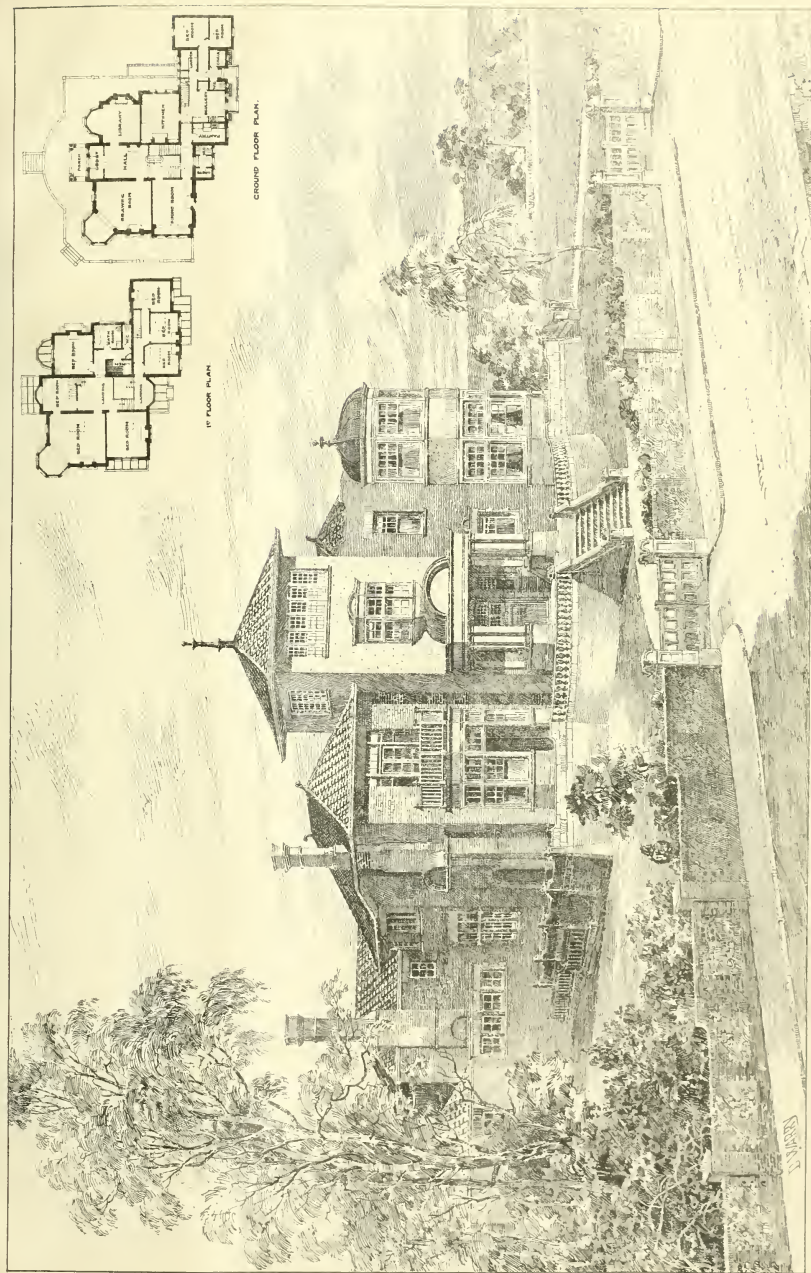
Northwest elevation

Corridor



PLACED SECOND





1ST FLOOR PLAN.



GROUND FLOOR PLAN.





TERRACE & SUMMER HOUSES DALHAM HALL SUFFO

Dec 27, 1901.



FOR SIR ROBERT AFFLECK BART. THOMSON, CEMALOW & GROCK ARCHITECTS



